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ALBERT B. FALL, SECRETARY

BUREAU OF MINES

H. FOSTER BAIN, DIRECTOR

FUSIBILITY OF ASH FROM COALS
OF THE UNITED STATES

BY

W. A. SELVIG and A. C. FIELDNER



WASHINGTON
GOVERNMENT PRINTING OFFICE
1922

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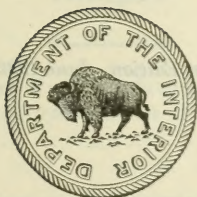
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FUSIBILITY OF ASH FROM COALS OF THE UNITED STATES.

By W. A. SELVIG and A. C. FIELDNER.

INTRODUCTION.

Information concerning the fusibility of coal ash has become of considerable value to the consumer of coal, mainly in connection with the troublesome formation of clinker resulting from the melting of the ash constituents of the burning coal. The growing interest in such data has led the Bureau of Mines to make a general survey of the "fusing" or "softening" temperatures of the ash from coals of the United States. It is hoped that this information when used together with the large number of coal analyses published¹ by the bureau will assist the consumer of coal in comparing different coals, and in selecting the coal best adapted for his purpose.

ACKNOWLEDGMENTS.

The laboratory fusibility tests were made by A. E. Hall, V. C. Allison, W. A. Selvig, C. R. Locke, C. S. Purcell, W. C. Ratliff, O. C. Brown, W. F. Holbrook, and A. M. Ondrejco, all of the chemical laboratory of the Bureau of Mines.

SOURCE AND COMPOSITION OF COAL ASH.

Coal ash is the incombustible residue remaining after the complete combustion of coal; it is derived from the inorganic mineral constituents of the coal. The ash-forming constituents are (1) inherent or intrinsic impurities that are present in an intimate mixture with the coal substance, and are derived either from the original material or from external sources such as sedimentation and precipitation while the coal-forming plant remains accumulated; (2) impurities, formed either during the laying down of the coal bed or subsequently, that occur in the form of partings, veins, and nodules of clay, shale, "slate," pyrite, and calcite; and (3) impurities that become intimately mixed with the coal in the process of mining, such as fragments of roof and floor.

¹ Lord, N. W., and others, Analyses of coals in the United States, with descriptions of mine and field samples collected between July 1, 1904, and June 30, 1910: Bull. 22, Bureau of Mines, 1913, 1,200 pp. (in two parts).

Fieldner, A. C., and others, Analyses of mine and car samples collected in the fiscal years 1911 to 1913: Bull. 85, Bureau of Mines, 1914, 444 pp.

Fieldner, A. C., and others, Analyses of mine and car samples collected in the fiscal years 1913 to 1916: Bull. 123, Bureau of Mines, 1917, 456 pp.

Fieldner, A. C., and others, Analyses of mine and car samples collected in the fiscal years 1916 to 1919: Bull. 193, Bureau of Mines (in press).

Coal ash is composed largely of compounds of silica, alumina, lime, and iron, with smaller quantities of magnesia, titanium, and alkali compounds. The chemical composition varies so widely that no typical composition can be given. In general the analyses of most coal ash will probably come between the following limits:

Typical limits of ash analyses.

Constituent.	Per cent.	Constituent.	Per cent.
SiO ₂	40-60	CaO.....	1-15
Al ₂ O ₃	20-35	MgO.....	.5-4
Fe ₂ O ₃	5-25	Na ₂ O + K ₂ O.....	1-4

This list of constituents shows that coal ash contains relatively large proportions of SiO₂ and Al₂O₃, and smaller proportions of the other oxides.

RELATION BETWEEN CHEMICAL COMPOSITION AND FUSIBILITY OF COAL ASH.

The fusibility of coal ash depends on several factors, such as the ratio of the silica to the bases present, the particular bases, and the percentage of alumina present. Mixtures extremely high in silica or extremely high in bases are not readily fusible. Ash that is low in iron is usually so highly siliceous that it is not readily fusible. Ash from coals high in pyrite is necessarily high in iron, and the ratio between the bases and silica is often such that easily fusible compounds may be formed. As a rule, coals containing considerable sulphur in the form of pyrite are apt to give trouble from clinker formation. Under conditions of the fuel bed the iron of the pyrite is apt to be converted to ferrous oxide, which with the silica present forms ferrous silicates that fuse at comparatively low temperatures. The chemical analyses of a series of five coal ashes ranging from very fusible (softening at 2,060° F.) to highly refractory (softening above 2,900° F.) is as follows:

Chemical analyses of five coal ashes covering a wide range of fusibility.

Sample No. ^a	Softening temperature, ° F.	Analyses of ash, percentage of—								
		SiO ₂ .	Al ₂ O ₃ .	Fe ₂ O ₃ .	TiO ₂ .	CaO.	MgO.	Na ₂ O.	K ₂ O.	SO ₂ .
1.....	2,060	30.7	19.6	18.9	1.1	11.3	3.7	1.9	0.5	12.2
2.....	2,320	46.2	22.9	7.7	1.0	10.1	1.6	.7	.8	8.9
3.....	2,500	49.7	26.8	11.4	1.2	4.2	.8	1.6	1.3	2.5
4.....	2,730	51.0	30.9	10.7	1.9	2.1	.9	1.0	.4	.6
5.....	+2,900	58.5	30.6	4.2	1.8	2.0	.4	.7	.9	.9

^a Sample No. 1, subbituminous coal, No. 3 bed, Montana; No. 2, bituminous coal, No. 6 bed, Illinois; No. 3, bituminous coal, Pittsburgh bed, Pennsylvania; No. 4, semibituminous coal, Pocahontas No. 3 bed, West Virginia; No. 5, bituminous coal, Dean bed, Kentucky.

RELATION OF FUSIBILITY TESTS TO CLINKER FORMATION.

It is well to bear in mind that the conditions of fusibility tests in the laboratory may not be directly comparable to the conditions in the fuel bed of a furnace. In a laboratory test the ash-forming constituents are intimately mixed, whereas there is usually no such uniform distribution of the ash-forming constituents in coal fire.

Some coal ash is so infusible that little trouble is experienced from the formation of clinker. Ash that is slightly more fusible will often form a porous, spongy clinker which does not seriously obstruct the flow of air through the fuel bed and is easily removed. Coal ash with a low fusing temperature, say 2,100° F., not only melts in the average fire box, but is heated several hundred degrees above its melting temperature, becoming quite fluid and spreading out in a thin sheet over the grate, thereby obstructing the flow of air and localizing the heat in the fuel bed.

The method adopted for making fusibility tests was the result of considerable experimental work,² by the Bureau of Mines on the nature of the fusion of coal ash and the influence of various oxidizing, reducing, and neutral atmospheres on the softening temperature of ash molded in the form of Seger cones. The method takes into consideration the various factors that influence the result obtained, with special reference to the atmosphere surrounding the ash during the test. The atmosphere in which the ash is heated is controlled by burning an excess of gas; a reducing atmosphere is thus obtained by which the iron in the ash is reduced mainly to the ferrous state, giving the lowest temperature at which clinkering may result.

This change in the iron is of special importance in testing coals that contain a relatively large proportion of iron in the form of pyrite. Higher softening temperatures may be expected with such coals in tests using oxidizing atmospheres which would oxidize the iron mainly to ferric oxide, or in tests using strongly reducing atmospheres which would reduce the iron largely to the metallic state. Under both conditions a more refractory slag is formed than would result if the atmosphere were such as to reduce the iron in the ash to ferrous oxide, which, with the silica present, would form readily fusible silicates. Ferric oxide forms with silica compounds that require a high temperature for fusion; on the other hand, if the iron is reduced to the metallic state, one of the most active fluxing constituents is removed from the system and high-fusing points result.

Analyses of clinkers from boiler furnaces indicated that fuel-bed conditions favored the formation of clinkers in which the iron was chiefly in the ferrous state; consequently the values obtained in the

² Fieldner, A. C., Hall, A. E., and Feild, A. L., The fusibility of coal ash and the determination of the softening temperature: Bull. 129, Bureau of Mines, 1918, 146 pp.

laboratory tests are, in this respect, comparable to such conditions, and the tests give the lowest temperatures at which the intimately mixed ash will soften with the formation of clinker.

GAS FURNACE METHOD FOR DETERMINATION OF FUSIBILITY OF COAL ASH.

FURNACE.

The No. 3 melter's furnace of the American Gas Furnace Co. was used in the tests. This furnace is a type of pot furnace especially suitable for fusion determination, as the three burners arranged on a tangent near the base of the furnace produce a rotary flame that completely surrounds the crucible in which the cones are placed. The whirling flame heats the crucible uniformly, and when an excess of gas is used, a reducing atmosphere is maintained within the crucible, giving the lowest point at which the ash fuses. The air is supplied at an approximate pressure of 3 pounds per square inch, and the gas used may be either natural or artificial.

The furnace proper consists of three easily replaceable parts of fire clay, namely, a lower cylinder containing the three tangential tuyeres and forming the bottom of the furnace; a removable upper cylinder 7 inches in internal diameter and 7 inches high; and a cover plate $1\frac{1}{2}$ inches thick having a vent hole in the center for the flue gas.

The stock design was modified by providing the upper cylinder with two holes in the side; one was a 2-inch observation hole with its center 4 inches from the top of the cylinder (excluding the cover plate) and the other was a 1-inch thermocouple hole 90° to the right of the observation hole. The bottoms of these two holes were in the same horizontal plane. The interior of the furnace is cylindrical and approximately 7 inches in diameter and 11 inches high. A counterbalanced sheet-iron canopy is connected with a telescopic 8-inch flue to an exhaust system for conducting the hot gases out of the room. Two melter's No. 3 furnaces and accessories are shown in Plate I.

The joint between the upper and lower cylinder is made fairly gas-tight by spreading on the top of the lower cylinder a thick paste of alundum cement to a depth of one-half inch and then firmly pressing the upper cylinder into place. The outer part of the joint is also smoothed over with alundum cement. The fire-clay cylinders and cover will withstand a temperature of about $1,650^\circ\text{C}$.

REFRACTORY CRUCIBLES.

The interior of the furnace as arranged for making a test is shown in figure 1. The ash cones *a* are supported on a plate of alundum cement serving as a cover for the crucible, *b*, which is a Denver fire-

clay hard-burned crucible, No. E, 4 inches high and 3 inches in diameter at the top. An alundum tube of the proper height may be used in place of crucible *b*. Crucible *d* is a Denver fire-clay hard-burned crucible, No. K, $7\frac{1}{4}$ inches high and $4\frac{3}{8}$ inches in diameter at the top; it has observation and thermocouple holes corresponding to those in the furnace cylinder, and it rests on a fire-clay support. The thermo element is protected by a glazed Marquadt porcelain tube, *e*, one-fourth inch in diameter. A fused silica tube, $1\frac{1}{8}$ inches in external diameter and 6 inches long, is placed in the observation hole of the furnace, the inner end being flush with the inside furnace wall and the other end projecting from the furnace. This crucible should be provided with two holes in the side, an observation hole 2 inches in diameter with its center 2 inches from the top of the crucible and a thermocouple hole 1 inch in diameter, 90° to the right of the observation hole. The bottom of this hole should be in the same horizontal plane as the bottom of the observation hole. The hard-burned fire-clay crucibles will not withstand a temperature exceeding $1,500^\circ\text{C}$. The average life of a fire-clay crucible under these conditions is about six runs.

Corundite crucibles and covers made by the Massillon Stone & Fire Brick Co. are longer lived than the fire-clay crucibles, being

good for about 50 runs to temperatures not exceeding $1,500^\circ\text{C}$. A special form used by the Bureau of Mines is 3 inches inside diameter, $4\frac{1}{2}$ inches high outside, with a wall about one-fourth inch thick. The crucibles should be provided with two holes in the side—an observation hole 2 inches in diameter with its center $1\frac{3}{4}$ inches above the bottom of the crucible, and a thermocouple hole 1 inch in diameter, 90° to the right of the observation hole. The bottom of this hole should be in the same horizontal plane as the bottom of the observation hole.

Recent tests with Zirkite crucibles of the Foote Mineral Co. show that they are longer lived than the fire-clay crucibles. A stock Zirkite crucible was used for 70 runs before failure, the temperatures being carried up to $1,500^\circ\text{C}$.

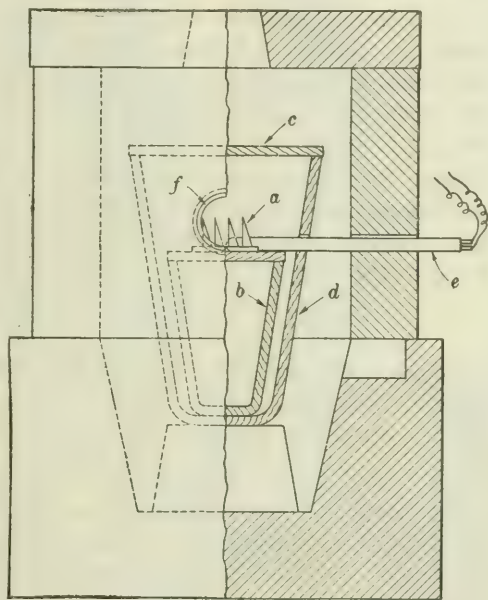


FIGURE 1.—Section of No. 3 melter's furnace arranged for fusion tests.

OBSERVATION TUBE.

A fused silica, refractory porcelain, or alundum tube, $1\frac{7}{8}$ inches in external diameter and 6 inches long, is placed in the 2-inch observation hole of the furnace, the inner end being flush with the inside furnace wall and the other end projecting out of the furnace. A brass sleeve carrying a thin clear glass window is slipped on the outer end of the observation tube to prevent the escape of burning gas, which would hinder convenient observation of the cones. When observations at high temperatures are made the cones are viewed through a piece of colored glass, such as Corning No. 6 shade, Noviweld.

BLOWING TUBE.

At furnace temperatures above $1,000^{\circ}$ C. observation of the ash cones is difficult. A Marquadt, Usalite, Impervite, or equal quality porcelain blowing tube one-fourth inch in diameter is inserted through the same hole as the thermocouple tube. This tube has small perforations along one side by which air may be forced upon the cones at the time of making the observation, thus momentarily cooling the ash cones and rendering them visible. The blowing tube is connected to the compressed-air line by means of rubber tubing, and the air is let into the tube at the time of observation by means of a pinchcock.

CONE MOLD.

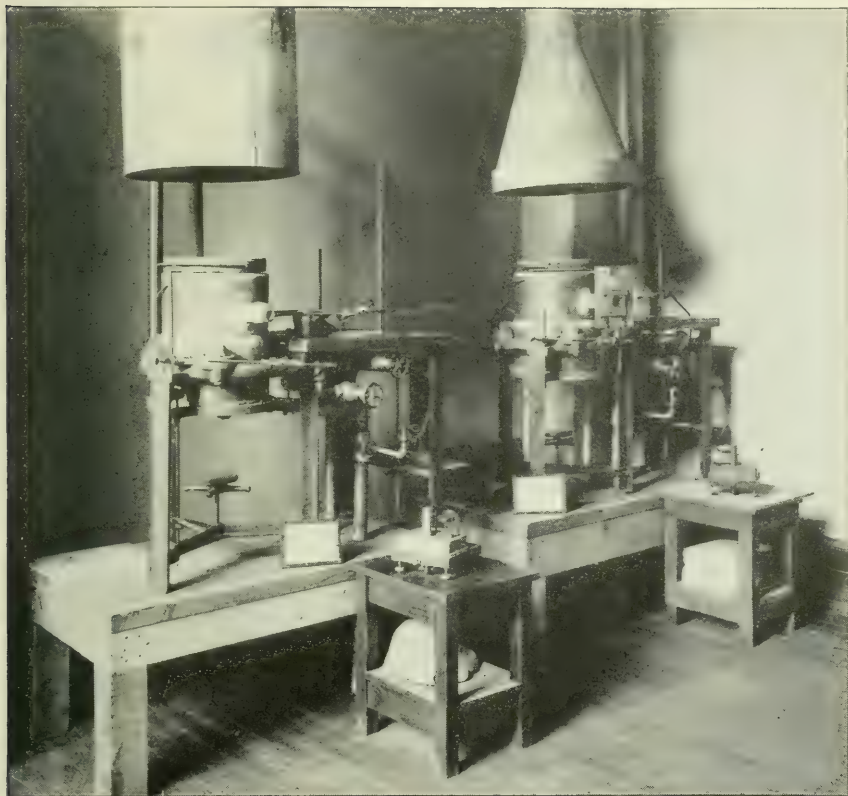
Figure 2 shows a brass cone mold for making ash cones, three-fourths inch high and one-fourth inch at each side of the base, which is an equilateral triangle.

PYROMETER.

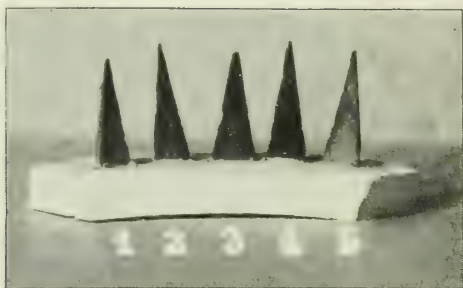
Temperature measurements may be made with a thermocouple of platinum and platinum-rhodium, protected from the furnace gases by a glazed Marquadt, Usalite, Impervite, or equal quality porcelain tube and a high resistance millivoltmeter; or with an optical pyrometer preferably of the Leeds & Northrup or Wanner type. This equipment should be checked frequently by mounting pieces of pure gold and nickel in the same manner as the cones. With a strong reducing atmosphere $1,452^{\circ}$ C. should be obtained for the melting point of nickel and $1,063^{\circ}$ C. for the gold. The pyrometer equipment should also be standardized from time to time through the temperature range for which it is used by a suitably equipped standardizing laboratory, such as that of the United States Bureau of Standards.

PREPARATION OF COAL ASH.

Spread out 50 to 100 grams of 60-mesh coal on a 5-inch fire-clay roasting dish, and completely convert it to ash in a muffle furnace at a temperature of 800° to 900° C. Transfer 5 to 10 grams of this ash



NO. 3 MELTER'S FURNACES AND ACCESSORIES.



A. CONES MOUNTED ON BASE.



B. TYPICAL FORM OF CONES FUSED IN NO. 3
MELTER'S FURNACE.

to an agate mortar and grind to a fineness of 200-mesh. A mechanical agate-mortar grinder will save time where many determinations are made. Place the finely ground ash in a silica or porcelain capsule, about five-eighths of an inch deep and $1\frac{3}{4}$ inches in diameter, and ignite for two hours in a current of oxygen, at a temperature of 800° to 850° C. The purpose of this ignition is to insure complete and uniform oxidation of the ash.

PREPARATION OF THE CONES.

Moisten the ignited ash with a 10 per cent dextrin solution, containing a small amount of salicylic acid as a preservative, and work into a plastic mass with a spatula. Mold the plastic material into small triangular pyramids three-fourths of an inch high and one-fourth inch wide at each side of the base. The pyramids are made by firmly pressing the plastic material with a steel spatula into a brass mold of the dimensions mentioned, the mold being similar to that shown in figure 2. Strike off the surface smooth and remove the cone from the mold by applying a small knife blade at the base. Mount the cones when dry in a refractory base composed of a mixture of equal parts of kaolin and calcined alumina. Moisten the base mixture to make it workable, and spread a part of it out on a sheet-iron plate. Then mount the cone in a vertical position in a small

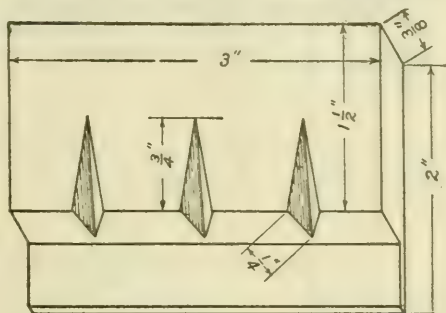


FIGURE 2.—Brass cone mold for making ash cones.

hole made in the base, and put a little of the base material into the hole around the bottom of the cone to fill the crevices and to make the cone stand firmly. Usually five cones are mounted on one base in the manner shown in Plate II, A. Dry the sheet-iron plate with the test piece on a hot plate, then ignite the cones at a dull red heat for 30 minutes in an open muffle to remove carbonaceous material.

METHOD OF HEATING.

Put the test piece in the muffle furnace in the position shown in figure 1, place the loosely fitting cover *c* on the crucible, and ignite the gas. It is necessary to let the gas burn about 10 minutes to heat the furnace parts before the large cover plate of the furnace is replaced; otherwise the flame is apt to blow out. After the cover plate of the furnace has been put in position, the flow of gas and air is increased enough to cause combustion to take place just above the tuyeres and yet maintain a yellowish flame at least 6 inches above the opening in the furnace cover plate. While such a flame is main-

tained above the furnace, gradually increase the temperature by a suitable adjustment of gas and air to 800°C ., then reduce the rate

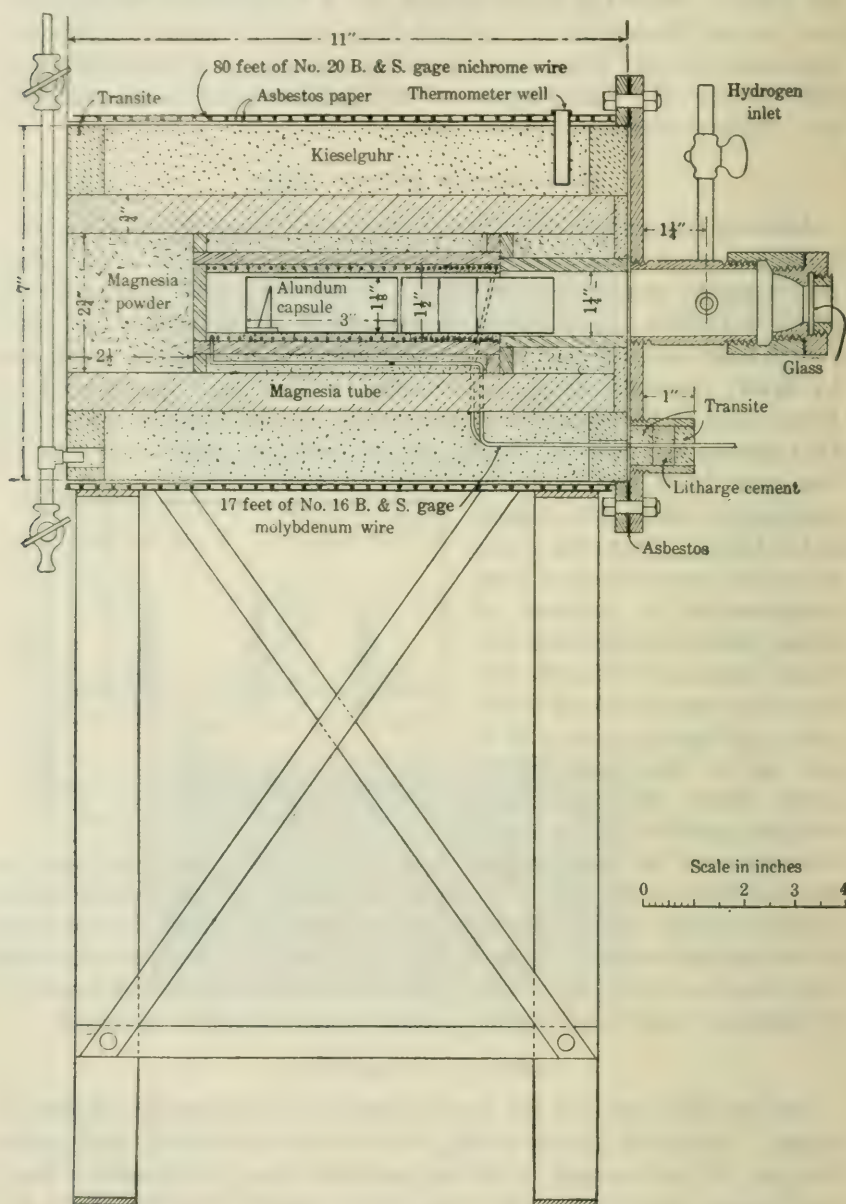


FIGURE 3.—Vertical longitudinal section through molybdenum furnace.

of heat increase to not less than 5°C . and not more than 10°C . per minute. Maintain this rate until the end of the test.

It is important that the 6-inch reducing flame be maintained at the furnace vent throughout the test, if possible, and at all events up to a temperature of $1,450^{\circ}\text{C}$. Temperatures above $1,450^{\circ}\text{C}$. require larger proportions of air to gas; however, a strongly reducing atmosphere is not so essential at the higher temperatures, because refractory ashes, on account of their low iron-oxide content, are only slightly affected by oxidizing or reducing atmospheres. After a test has been completed, turn the supply of gas and air off gradually to avoid cracking the muffle crucible.

The softening temperature is defined as the temperature at which the cone has fused down to a spherical lump, as shown in cones 2 and 3 of Plate II, *B*. Cone 4 has almost reached the softening temperature.

Critical points other than the softening temperature may be observed during the test and may be of value. They are as follows:

The initial deformation temperature—the temperature at which the first rounding or bending of the apex of the cone takes place, as shown in cone 1 of Plate II, *B*. Such bending must not be confused with a shrinking or warping of the cone.

The fluid temperature—the temperature at which the cone has spread over the base in a flat layer, as represented by cone 5 of Plate II, *B*.

The permissible differences of the softening temperature point in duplicate determinations are as follows: Same analyst, 30°C .; different analysts, 50°C .

MOLYBDENUM-WIRE RESISTANCE FURNACE.

Owing to the short life of the refractory crucibles used when heated to temperatures higher than $1,500^{\circ}\text{C}$., ashes that did not fuse at $1,500^{\circ}\text{C}$. were heated in a molybdenum-wire resistance furnace³ in an atmosphere of hydrogen gas to a temperature of $1,650^{\circ}\text{C}$. A vertical longitudinal section of the molybdenum-wire resistance furnace is shown in figure 3. Hydrogen gas is used in this type of furnace to prevent oxidation of the molybdenum resistance wire. Ashes softening above $1,500^{\circ}\text{C}$. have as a rule such a low iron content that the nature of the atmosphere surrounding the ash cones during the test has little influence on the fusibility.

INTERPRETATION OF THE FUSIBILITY TABLE.

With the exception of a few car samples of coal, the samples listed are all standard mine samples collected by representatives of the Bureau of Mines, the United States Geological Survey, or by various State geological surveys, according to methods used by the Bureau of

³ Fieldner, A. C., Hall, A. E., and Feld, A. L., The fusibility of coal ash and the determination of the softening temperature: Bureau of Mines, Bull. 129, 1918, pp. 74-79.

Mines.⁴ The car samples were collected by representatives of the Bureau of Mines according to standard methods.⁵ Car samples are designated as such in the table under the name of the mine.

The arrangement of the samples in Table I is alphabetical according to State, county, town, mine, and coal bed. The laboratory numbers of the samples collected from each mine are given; by means of these numbers the chemical analysis and the description of the samples can be obtained by reference to bulletins of the Bureau of Mines. (See footnote, p. 1.)

In classifying the coals according to rank the usage of the United States Geological Survey⁶ has been followed. In order to attain brevity, this rank is abbreviated. Thus, A signifies anthracite; S. A., semianthracite; S. B., semibituminous; B, bituminous; Sb. B., subbituminous; L., lignite; and N. C., natural coke.

The number of samples, the lowest, highest, and average softening temperatures in degrees Fahrenheit, and the percentage of ash and sulphur in the dry coal are tabulated for each mine. Samples remaining unfused at 3,010° F., which was the highest temperature attained in the tests, are marked by plus 3,010 (+3,010) and used as such in figuring the average values for the mine.

DISCUSSION OF FUSIBILITY VALUES.

CLASSES OF FUSIBILITY.

In general, the softening temperature of coal ash from the coals of the United States ranges from 1,900° to 3,100° F. For convenience in discussion, the order of fusibility of ash may be expressed by subdividing this range of softening temperature into three groups, as follows:

Class 1, refractory ashes, softening above 2,600° F.

Class 2, ashes of medium fusibility, softening between 2,200° and 2,600° F.

Class 3, easily fusible ashes, softening below 2,200° F.

EASTERN COALS.

The coals of Ohio which were tested gave ash of medium fusibility, mainly in class 2.

The bituminous and semibituminous coals of Pennsylvania that were tested gave refractory class 1 ash and medium fusible class 2 ash, chiefly the latter. Only a small number of coals from the Pennsylvania anthracite region were tested; these gave refractory ash in class 1.

⁴ Holmes, J. A., The sampling of coal in the mine; Tech. Paper 1, Bureau of Mines, 1911, 18 pp.

⁵ Pope, G. S., Directions for sampling coal for shipment or delivery; Tech. Paper 133, Bureau of Mines, 1917, 15 pp.

⁶ Campbell, M. R., The coal fields of the United States: U. S. Geological Survey Prof. Paper 100-A, 1917, pp. 3-9.

The West Virginia coals represent all three classes of fusibility. The semibituminous coals of West Virginia come principally in class 1 and class 2. Some very refractory class 1 coals are found in the Beckley bed in Raleigh County.

Many of the coals of Maryland that were tested gave a refractory ash coming in class 1 or in the upper part of class 2.

The softening temperature of the ash from coals of eastern Kentucky and of Virginia cover a wide range of fusibility from readily fusible ash, class 3, to refractory ash, class 1.

The coals tested from Tennessee and Alabama come mainly in class 2, having ash of medium fusibility, but both class 1 and class 3 are represented.

COALS OF THE INTERIOR PROVINCE.

Coals from Illinois, Indiana, western Kentucky, Kansas, Missouri, Oklahoma, and Arkansas are represented in Table I. The softening temperature of the ash from these coals is uniformly low, practically all of the coals tested coming in class 3. The uniformly low softening temperature of the ash is unquestionably due to the rather general distribution of pyrite, calcite, and frequently gypsum in the coal beds. Usually the percentage of iron and lime in the ash is high, and in general mines producing coal lower in sulphur than the average for the bed also produced coal having ash of higher fusibility than the average for the bed.

As may be expected, samples from the same mine do not show ash of uniform fusibility because the composition of the ash-forming constituents included in the samples differ. This variation of fusibility of samples of coal from the same mine in the interior province is not large, averaging but 140° F. for the mines represented in the table. In only a few instances is the difference between the lowest and highest softening temperatures of a number of samples from the same mine more than 300° F. The majority of mines gave samples coming within the average difference of 140° F. between the lowest and highest values.

WESTERN COALS.

A great variety of coal is found in the West, ranging from lignite to anthracite. In the table are listed coals from Alaska, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Utah, Washington, and Wyoming.

Most of the samples of Alaska coal listed were taken from outcrops or prospects, and range from refractory class 1 ash to ash of medium fusibility of class 2.

The coals from Washington show all three classes of fusibility. The majority of the samples, however, come in class 1 and class 2.

These coals have a high ash content, but in many the ash is refractory. Oregon and California contain little coal.

The coals tested from Colorado and New Mexico range from refractory class 1 ash to easily fusible class 3 ash, the majority of the samples tested coming in class 1 and class 2.

Many of the coals from Utah showed ash of comparatively low fusibility, in the upper part of class 3; a considerable number of samples gave ash of medium fusibility, in class 2. A few samples gave refractory class 1 ash.

Idaho and Nevada are of no commercial importance as coal producers, for only a little coal is found in these States.

The lignites tested, from North Dakota, South Dakota, and Montana, have ash of rather low fusibility, the majority of the samples coming in class 3 or the lower part of class 2.

The subbituminous coals tested from Montana and Wyoming also gave ash of rather low fusibility, most of the samples coming in class 3 and the lower part of class 2.

Most of the lignites and subbituminous coals listed in the table have a fairly low sulphur content, consequently the low melting points of the ash from these fuels can not be attributed to the presence of large amounts of iron in the form of pyrite, but rather to the presence of other mineral constituents in the proper proportion to form readily fusible mixtures.

FUSIBILITY OF COAL ASH FROM MINE AND FROM CAR SAMPLES.

In collecting mine samples of coal the Bureau of Mines endeavors to have the samples represent as nearly as possible the coal that is produced commercially; car samples as a rule, however, have a higher ash content than mine samples from the same mine because of impurities that become mixed with the coal in mining. Theoretically the extraneous impurities that are included in the coal as mined may either lower or raise the fusibility of the coal ash. If these impurities consist of substances such as pyrite, the ash of the coal mined would probably be more fusible than the ash of the mine samples; on the other hand, an addition of shale may make the ash more refractory, especially in coals having ash of rather low fusibility.

Table II lists all mines from which both mine and car samples have been collected, and gives the ash fusibility of mine and car samples from the same mine. A study of this table is of interest in connection with the variation of ash fusibility of mine and car samples. If the difference between the softening temperatures of coal ash from mine and car samples does not exceed 100° F., it may be considered that the degree of fusibility is substantially the same. Data in Table II have been summarized below to show the number of mines from

which the fusibility of ash of mine and car samples were substantially the same; that is, within 100° F. The number of mines from which the ash of the car samples was more refractory and the number of mines from which the ash from the mine samples was more refractory is as follows:

Summary of Table II comparing fusibility of ash from mine and car samples.

State.	Number of mines from which ash of car and mine samples was substantially of the same fusibility—within 100° F.	Number of mines from which ash of car samples was more refractory.	Number of mines from which ash of mine samples was more refractory.
Illinois.....		1	2
Maryland.....	1		
Pennsylvania.....	2	1	3
Virginia.....			1
West Virginia.....	32	9	15

TABLE I.—Softening temperatures of coal ash from coals of the United States.

Locality.	Mine.	Coal bed.	Rank of coal. ^a	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
I										
ALABAMA.										
BIBB COUNTY.										
Belle Ellen.....	Belle Ellen.....	Youngblood.....	B.	26276-80.....	5	2,010	2,220	2,070	5.29	1.37
Coleman.....	Coleman.....	Thompson.....	B.	20132-34, 42.....	4	2,060	2,150	2,110	8.24	.58
Garnsey.....	Garnsey.....	do.....	B.	25431-33.....	3	2,370	2,400	2,380	11.69	.49
Marvel.....	Marvel.....	Youngblood.....	B.	9666.....	1	.....	.....	2,190	11.95	.78
Do.....	Do.....	Clark.....	B.	25379-81, 84.....	4	2,180	2,500	2,320	7.20	.66
Do.....	Do.....	Gholson.....	B.	10460-61, 65.....	3	2,180	2,310	2,230	9.20	.87
Piper.....	Piper No. 1.....	Thompson.....	B.	25383, 85-86.....	3	2,130	2,320	2,200	6.61	.49
DEKALB COUNTY.										
Blanche.....	Underwood Prospect.....	Unnamed.....	S. B.	18232.....	1	.....	.....	2,280	11.46	2.74
Do.....	Yellow Creek.....	Yellow Creek.....	S. B.	18230, 33-34.....	3	.....	.....	2,620	13.41	1.44
Fort Payne.....	Beeson Gap.....	Unnamed.....	S. B.	18231.....	1	2,570	2,700	2,210	16.84	4.56
JEFFERSON COUNTY.										
Bessemer.....	Virginia.....	Nickle Plate.....	B.	26217-20, 22.....	5	2,470	2,900	2,620	4.73	.75
Littleton.....	Banner.....	Mary Lee ("Big").....	B.	12083-85.....	2	2,710	2,860	2,770	11.92	.84
Majestic.....	Majestic.....	Black Creek.....	B.	32070-73.....	4	2,460	2,730	2,600	3.96	.60
Morris.....	Indio.....	Jefferson.....	B.	16683-86.....	4	2,060	2,220	2,120	7.45	2.80
Mulga.....	Mulga.....	Pratt.....	B.	19970-71, 78-80.....	7	2,290	2,580	2,430	5.49	1.59
Bessie.....	do.....	Mary Lee ("Big").....	B.	26900-02, 14-16.....	6	2,900	2,950	2,870	10.44	.78
Palos.....	do.....	do.....	B.	10505-06.....	2	2,870	2,930	2,900	7.36	.58
Pinson.....	Dixana No. 4.....	Black Creek.....	B.	22467-70.....	4	2,460	2,750	2,560	2.73	.82
Sayreton.....	Sayreton.....	Mary Lee ("Big").....	B.	20993-94, 96.....	3	2,670	2,850	2,770	10.47	.77
ST. CLAIR COUNTY.										
Coal City.....	Coal Branch.....	Coal City.....	B.	12440-42.....	3	2,180	2,330	2,250	4.35	1.19
Do.....	Vulcan No. 4.....	Broken Arrow.....	B.	12437-38.....	2	2,350	2,400	2,380	10.16	1.46
Parsons.....	Acmar.....	Harkness.....	B.	18833-54.....	2	2,650	2,660	2,660	11.73	.90
Blanie.....	Margaret No. 1.....	do.....	B.	18549-51.....	2	2,270	2,280	2,280	12.62	2.01
Do.....	do.....	do.....	B.	24574-76.....	3	2,340	2,660	2,450	10.19	1.81

SHELBY COUNTY.									
Aldrich.....	Aldrich.....	B.	26730-33.....	4	2,060	2,470	2,330	7.24	.76
Glen Carbon.....	Glen Carbon.....	B.	10502-04, 9667.....	4	2,150	2,410	2,240	4.08	.59
Helena.....	Helena.....	B.	18288-90.....	3	2,230	2,500	2,360	7.80	.53
Do.....	Do.....	B.	25543-45.....	3	2,400	2,610	2,470	10.02	.39
Eureka.....	Eureka.....	B.	9610.....	1	.....	.....	2,380	8.92	.42
Maylene.....	Maylene.....	B.	26301-04.....	2	2,190	2,470	2,320	7.66	.48
Do.....	Do.....	B.	14391-92.....	4	2,200	2,490	2,340	7.45	.88
Straven.....	Upper Straven.....	B.	.....	2	.....	.....	.....	.....	.....
TUSCALOOSA COUNTY.									
Abernant.....	Abernant.....	B.	14717.....	1	.....	.....	2,930	9.33	.66
Rock Castle.....	Rock Castle.....	B.	18510-12.....	3	2,450	2,640	2,550	8.90	.66
WALKER COUNTY.									
Carbon Hill.....	Galloway No. 11.....	B.	24954-57.....	4	2,390	2,910	2,600	11.19	.69
Dora.....	Sipsey.....	B.	18404-07.....	4	2,330	2,580	2,420	3.25	1.03
Parrish.....	Mary Lee.....	B.	77605-08.....	4	2,520	2,740	2,670	14.13	.82
ALASKA.									
BERING RIVER.									
Wardall Ridge.....	Unnamed.....	S. B.	22932.....	1	.....	.....	2,820	7.27	.68
Do.....	Do.....	S. B.	22933.....	1	.....	.....	2,410	1.27	.70
FAIRHAVEN DISTRICT.									
Candle.....	Unnamd.....	Sb. B.	19928.....	1	.....	.....	2,410	6.44	1.51
IDITAROD DISTRICT.									
Iditarod.....	Unnamd.....	A.	19347.....	1	.....	.....	2,380	7.35	1.12
INUOKO DISTRICT.									
Tramway.....	Unnamd.....	A.	26370.....	1	.....	.....	2,710	5.27	.80
KENAI PENINSULA.									
Port Graham.....	Unnamd.....	Sb. B.	17489.....	1	.....	.....	2,400	15.80	1.06
MATANUSKA FIELD.									
Anthracte Ridge.....	Unnamd.....	S. A.	12745.....	1	.....	.....	2,250	26.23	.20
Do.....	Do.....	B.	17792.....	1	.....	.....	2,900	8.02	.30
Boulder Creek.....	Do.....	B.	19346.....	1	.....	.....	2,910	9.14	.45

^aThe abbreviations for the rank of coal are as follows: A., anthracite; S. A., semianthracite; S. B., semibituminous; B., bituminous; Sb. B., subbituminous; L., lignite; and N. C., natural coals.

TABLE I.—Softening temperatures of coal ash from coals of the United States—(Continued).

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
ALASKA—Contd.										
MATANUSKA FIELD—continued.										
Chickaloon River	U. S. N. A. C. I. E., tunnel B	Lower No. 5	S. B.	18148	1			3,000	9.55	0.58
Do.	do.	No. 51	B.	18141	1			2,040	8.14	.62
Do.	do.	No. 6	B.	18143	1			2,270	3.07	.69
Do.	do.	No. 9	B.	18150	1			+ 3,000	20.54	.55
Do.	U. S. N. A. C. I. E., tunnel D	E	B.	17793	1			2,980	12.23	.54
Do.	do.	E	B.	18046	1			2,250	11.13	1.51
Do.	U. S. N. A. C. I. E., tunnel 1	No. 8	B.	18093, 101	2	2,420	2,800	2,650	10.19	.64
Do.	Chickaloon	No. 8	B.	18153	2	2,370	2,840	2,600	11.94	.43
Do.	U. S. N. A. C. I. E., tunnel 2	Upper No. 5	B.	18153	1			2,980	7.89	.57
Do.	U. S. N. A. C. I. E., tunnel 3	No. 3	B.	18095	1			2,640	5.78	.60
Do.	do.	No. 4	B.	18138	2			2,230	9.49	.65
Do.	U. S. N. A. C. I. E., tunnel 4	C	B.	18100	1			2,980	11.03	.51
Coal Creek	Outcrop	No. 2	B.	18321	1			2,380	3.47	.33
Do.	do.	do.	B.	18094	1			2,480	4.65	.41
Do.	do.	do.	B.	18040	1			2,060	9.77	.43
Do.	do.	No. 3	B.	18103	1			2,800	10.31	.36
Do.	do.	do.	B.	18041	1			2,510	5.93	.40
Do.	do.	No. 4	B.	18320	1			2,270	6.82	.52
Do.	do.	No. 5	B.	18322	1			3,000	9.88	.40
Do.	do.	No. 6	B.	18092	1			3,000	11.94	.45
Do.	do.	do.	B.	18109	1		2,290 2,520	2,980	9.65	.46
Do.	U. S. N. A. C. I. E., tunnel A	No. 8	B.	18104, 08, 39	3			2,390	5.62	.47
Do.	U. S. N. A. C. I. E., drift 1	No. 1	B.	18107	1			2,950	9.21	.22
Do.	U. S. N. A. C. I. E., drift 2	No. 4	B.	18096	1			2,820	13.41	.62
Do.	Kelly	Kelly	B.	28731-32	2	2,210	2,660	2,440	8.27	.50
Emery	David	David	B.	28733	1			2,740	5.79	.35
Do.	Emery	Emery	B.	28735	1			2,690	10.26	.39
Eska	Eska	Eska	B.	28734	1			2,640	18.39	.46
Do.	Mattland	Mattland	B.	28736	1			2,150	7.62	.37
Do.	McCauley prospect	McCauley	B.	28836	1			+ 3,010	9.96	.57

Kings River.....	Outcrop.....	No. 1.....	B.	18137.....	1	11 18	51
Do.....	do.....	do.....	B.	18319.....	1	8 73	58
Do.....	do.....	do.....	N. C.	18138.....	1	2 310	20
Do.....	do.....	do.....	B.	18136.....	1	2 610	20
Matanuska River.....	do.....	No. 2.....	B.	18151.....	1	2 620	16 47
Moose Creek.....	do.....	Unnamed.....	B.	18144.....	1	2 680	20 72
Do.....	do.....	do.....	B.	28837.....	1	2 800	9 37
Young Creek.....	do.....	do.....	B.	11382.....	1	2 450	5 66
NENANA FIELD.							
California Creek.....	Outcrop.....	Unnamed.....	L.	26359.....	1	25 56	58
Do.....	do.....	do.....	L.	26360-61.....	2	2 370	34 71
Healy Creek.....	do.....	do.....	L.	17796.....	1	2 450	6 10
Do.....	do.....	do.....	L.	26368.....	1	2 400	7 53
Igloo Creek.....	do.....	do.....	L.	17794-95.....	2	2 320	4 78
Lignite Creek.....	do.....	do.....	L.	26362.....	2	2 340	13 30
Do.....	do.....	B.....	L.	26588.....	1	2 150	9 93
Do.....	do.....	No. 5.....	L.	26363.....	1	2 450	7 18
Do.....	do.....	do.....	L.	26364.....	1	2 370	16 42
Do.....	do.....	do.....	L.	26365.....	1	2 450	5 52
Do.....	do.....	do.....	L.	26366.....	1	2 210	11 07
Do.....	do.....	do.....	L.	26367.....	1	2 390	8 01
Do.....	do.....	do.....	L.	26369.....	1	2 300	15 43
Nenana River.....	do.....	do.....	L.	23042.....	1	2 370	5 07
Tatlanika River.....	do.....	do.....	L.	17797.....	1	2 670	22 55
YAKATAGA FIELD.							
Duktoth Valley.....	Outcrop.....	Unnamed.....	S. B.	19345.....	1	+3,000	23 69
ARKANSAS.							
FRANKLIN COUNTY.							
Denning.....	Denning No. 2.....	Denning (Hartshorne?).....	S. B.	18746-48.....	3	2 180	2 230
LOGAN COUNTY.							
Paris.....	Grand No. 1.....	Paris.....	S. B.	18750-52.....	3	2 130	2 160
POPE COUNTY.							
Russellville.....	Bernice.....	Shinn Basin.....	S. A.	18755, 57.....	2	2 180	2 370
SEBASTIAN COUNTY.							
Hackett.....	Branner No. 2.....	Hartshorne.....	S. B.	18062-63.....	2	2 310	2 340
Hartford.....	Central No. 10.....	do.....	S. B.	29836.....	1	2 096	11 27
Do.....	do.....	do.....	S. B.	29835.....	1	2 000	10 07
Huntington.....	Central No. 6.....	Upper and Lower Hartshorne.....	S. B.	27615-16.....	4	2 060	2 120
Jenny Lind.....	Jenny Lind No. 17.....	Hartshorne.....	S. B.	18267.....	1	2 090	9 60
						2 110	9 70
							1 42
							2 01
							82
							10 07
							11 27
							1 15
							1 30
							2 23
							3 28
							10 12
							7 38
							2 45
							23 69
							58
							32
							54
							21
							35
							18
							25
							25
							26
							21
							24
							14
							32
							22
							27
							58

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, per-centage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
I										
CALIFORNIA.					2	3	4	5	6	7
MENDOCINO COUNTY.										
Dos Rios.....	Outcrop.....	Unnamed.....	S. B.	31139.....	1	.....	.....	2,220	6.91	2.98
MONTEREY COUNTY.										
Stone Canon.....	Stone Canon.....	Unnamed.....	B.	31100-01.....	2	2,210	2,470	2,340	11.26	4.62
COLORADO.										
ADAMS COUNTY.										
Bennett.....	Thomas.....	Unnamed.....	Sb. B.	13141.....	1	.....	.....	2,120	11.35	.48
BOULDER COUNTY.										
Broomfield.....	Monarch No. 2.....	Unnamed.....	Sb. B.	31314-15.....	2	1,990	2,030	2,010	6.54	.33
Lafayette.....	Simpson.....	.....	Sb. B.	15165, 31391.....	2	2,030	2,130	2,080	4.45	.48
Louisville.....	Acme.....	Lower Acme.....	Sb. B.	31384.....	1	.....	.....	2,040	5.46	.40
Superior.....	Industrial.....	Unnamed.....	Sb. B.	33253-55.....	3	2,060	2,140	2,100	6.89	.37
DELTA COUNTY.										
Bowie.....	King.....	"King".....	B.	15213, 28920.....	2	2,470	2,740	2,600	5.06	.60
Dominguez.....	Wells Gulch.....	Unnamed.....	B.	11106.....	1	.....	.....	2,160	6.20	1.01
EL PASO COUNTY.										
Calhan.....	Mosby.....	Mosby.....	Sb. B.	10732.....	1	.....	.....	2,520	20.77	.45
Colorado Springs.....	"A".....	"A".....	Sb. B.	28907-09.....	3	2,190	2,260	2,230	7.99	.43
Pike View.....	do.....	do.....	Sb. B.	12066, 28911-15.....	6	2,070	2,350	2,250	7.37	.41
Ramah.....	Purdon.....	Purdon.....	Sb. B.	10741.....	1	.....	.....	2,510	27.45	.48

FREMONT COUNTY.		Chandler.....	Chandler.....	Sb. B.	75375-79.....	4	2, 060	2, 060	2, 080	7, 34
		do.....	do.....	Sb. B.	13393-94.....	2	2, 060	2, 130	2, 100	7, 25
		Rockvale.....	Rockvale.....	Sb. B.	11938-39.....	2	2, 080	2, 350	2, 220	10, 43
		Williamsburg.....	Magnet.....	B.	10127-28.....	2	2, 030	2, 130	2, 080	7, 90
GARFIELD COUNTY.		Vulcan.....	Allen.....	B.	12325-26, 420, 18366, 376.....	5	2, 060	2, 370	2, 220	5, 75
		South Canon.....	Wheeler.....	B.	15166-67.....	2	2, 360	2, 410	2, 380	8, 78
GUNNISON COUNTY.		Alpine.....	No. 2.....	B.	10092.....	1	.....	.....	2, 310	7, 30
		Kubler.....	do.....	B.	10091.....	1	.....	.....	2, 380	9, 51
		Somerset.....	Unnamed.....	B.	12322-23.....	2	2, 240	2, 240	2, 240	9, 74
HUEFANO COUNTY.		Gordon.....	Cameron.....	B.	33564-65.....	2	2, 280	2, 300	2, 290	11, 48
		do.....	Walsen.....	B.	33567.....	1	.....	.....	2, 670	9, 89
		Del Carbon.....	Robinson.....	B.	33561-62.....	2	2, 180	2, 350	2, 260	8, 09
		do.....	Cameron.....	B.	33651.....	1	.....	.....	2, 240	7, 33
		do.....	Walsen.....	B.	33645-49.....	5	2, 330	2, 430	2, 330	11, 29
		Farr.....	do.....	B.	34239-41.....	3	2, 430	2, 620	2, 510	15, 43
		Lester.....	do.....	B.	34193-94.....	2	2, 400	2, 640	2, 520	11, 08
		Maitland.....	do.....	B.	33818.....	2	.....	.....	2, 680	13, 70
		do.....	Lenox.....	B.	33817.....	1	.....	.....	2, 400	15, 31
		Pinon.....	Robinson.....	B.	10189-90.....	2	2, 330	2, 340	2, 340	10, 30
		McGuire.....	Cameron.....	B.	13526-28.....	3	2, 130	2, 690	2, 330	10, 50
		Oakview.....	Unnamed.....	B.	34161.....	1	.....	.....	2, 670	8, 19
		do.....	Marmouth.....	B.	33497.....	1	.....	.....	2, 210	11, 62
		Pictou.....	Walsen.....	B.	33496.....	1	.....	.....	2, 510	10, 48
		Ravenwood.....	Walsen and Robinson.....	B.	31409-07.....	2	2, 500	2, 520	2, 500	8, 38
		Strong.....	Walsen.....	B.	33655-56.....	2	2, 480	2, 530	2, 500	9, 24
		Tioga.....	Robinson.....	B.	33734-35.....	2	2, 100	2, 150	2, 120	8, 29
		Toltec.....	do.....	B.	33493.....	1	.....	.....	2, 700	10, 51
		do.....	Walsen.....	B.	33492.....	1	.....	.....	2, 300	10, 43
		Walsen.....	Robinson.....	B.	33897-99.....	3	2, 400	2, 440	2, 410	11, 65
		do.....	Walsen.....	B.	33892-95.....	3	2, 280	2, 360	2, 340	10, 84
		Walsenberg.....	do.....	B.	33949.....	1	.....	.....	2, 500	15, 63
JACKSON COUNTY.		Riach.....	Riach.....	Sb. B.	12601.....	1	.....	.....	2, 580	8, 94
		Coalmont.....	Mitchell.....	Sb. B.	12539.....	1	.....	.....	2, 270	12, 56
		Walden.....	Marr.....	Sb. B.	12415.....	1	.....	.....	2, 440	4, 31
		do.....	McAllum.....	Sb. B.	12774.....	1	.....	.....	2, 370	7, 78
		do.....	Sudduth.....	Sb. B.	12414.....	1	.....	.....	2, 440	6, 25
		do.....	do.....	Sb. B.	12775.....	1	.....	.....	2, 190	14, 80
		do.....	Wincom.....	Sb. B.	.....	1	.....	.....	.....	.....

Starkville.....	Engle-Starkville.....	B.	11134-35, 12198-97, 32030.	5	2,800	2,990	2,890	15.31	.60
Tollerburg.....	Berwind.....	B.	13253-54.....	2	2,530	2,760	2,640	12.08	.68
MESA COUNTY.									
Cameo.....	Cameo.....	B.	28917-18.....	2	2,710	2,960	2,840	9.58	.63
MOFFAT COUNTY.									
Axial.....	Battle Era.....	B.	14528.....	1			2,220	7.17	1.04
Do.....	Ed Collom.....	B.	14529.....	1			2,350	4.49	.78
Do.....	James.....	B.	12704.....	1			2,380	4.37	.61
Do.....	Joe Collom.....	B.	14543.....	1			2,430	2.51	.36
Do.....	Shafer.....	B.	14909.....	1			2,300	4.50	.68
Craig.....	Blevins.....	Sb. B. (?)	17696.....	1			2,210	7.76	.79
Do.....	Hart.....	Sb. B.	17782.....	1			2,740	6.49	.62
Do.....	Kimberly.....	Sb. B.	17933.....	1			2,190	5.57	.92
Do.....	Roby.....	Sb. B.	17840.....	1			2,890	4.87	.69
Do.....	Seick.....	Sb. B.	17592.....	1			2,010	9.29	.85
Do.....	Walker.....	Sb. B.	12400, 22725.....	2	2,080	2,090	2,080	7.36	1.06
Lay.....	do.....	Sb. B. (?)	17686.....	1			2,440	6.75	1.04
Mount Streeter.....	Collom.....	Sb. B. (?)	32968-69.....	2	2,230	2,540	2,380	2.90	.33
MONTEZUMA COUNTY.									
Cortez.....	Cortez.....	B.	12785.....	1			2,980	15.42	.62
Do.....	Hamilton Prospect.....	B.	12686.....	1			2,710	13.04	.90
Do.....	Jackson.....	B.	16472-74.....	33	2,240	2,560	2,370	6.36	.54
Do.....	Mowry.....	B.	12586-16479.....	2	2,110	2,130	2,120	16.13	7.64
Do.....	Todd.....	B.	16476-77, 20267.....	3	2,190	2,380	2,260	7.63	.78
Dolores.....	Prospect.....	B.	12551.....	1			2,810	9.11	.59
Manitou.....	Old Spencer.....	B.	20498.....	1			2,430	5.82	1.08
Do.....	Spencer.....	B.	20500.....	1			2,510	4.80	.66
OURAY COUNTY.									
Ridgway.....	Lou Creek.....	B.	12651.....	1			2,450	8.24	.68
PITKIN COUNTY.									
Placita.....	Placita.....	B.	25826.....	1			2,370	6.75	.50
RIO BLANCO COUNTY.									
Meeker.....	Black Diamond.....	B.	12776.....	1			2,990	8.95	.55
Do.....	Cornike.....	B.	12695.....	1			2,310	2.57	.33
Do.....	Fairfield.....	B.	12518.....	1			2,370	6.97	.96
Do.....	Meeker.....	B.	12426.....	1			2,310	6.68	.90
Do.....	Montgomery.....	B.	12777.....	1			2,210	7.00	.81
Do.....	Sulphur Creek.....	B.	12773.....	1			2,780	9.26	.66
Do.....	Wesson.....	B.	12705.....	1			2,730	7.02	.95

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, per- centage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
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FREMONT COUNTY.	Brown Bear.....	Unnamed.....	B.	15115.....	1		2,090	4.86	.61
	Do.....	do.....	B.	15116.....	1		2,010	2.36	.41
	Monida.....	do.....	Sh, B.	29281.....	1	.....	2,270	12.80	.87
TETON COUNTY.	Driggs.....	Unnamed.....	B.	29182.....	1	.....	1,950	4.91	.58
	Victor.....	do.....	Sh, B.	29280.....	1	.....	2,160	38.40	1.41
ILLINOIS.	Cherry No. 2.....	No. 2.....	B.	12467-68.....	2	1,880	1,930	8.97	4.51
	Marquette No. 1.....	No. 3.....	B.	14584-86.....	3	1,990	2,130	8.99	2.75
	Spring Side.....	No. 6 (Herrin).....	B.	25748-49, 26330-37.....	4	1,920	2,060	11.37	4.58
FRANKLIN COUNTY.	United No. 2.....	No. 6 (Herrin).....	B.	23473-77.....	5	2,080	2,300	9.51	1.17
	Do.....	do.....	B.	26129.....	1	.....	2,150	8.54	1.14
	Bush No. 2.....	do.....	B.	30877-80.....	4	1,920	2,000	11.26	3.61
	Christopher.....	do.....	B.	24741-46.....	6	2,220	2,530	9.54	.84
	Old Ben No. 10.....	do.....	B.	30892-95.....	4	2,080	2,390	8.68	.88
	Do.....	do.....	B.	22881-90.....	5	2,240	2,440	9.20	1.03
	Do.....	do.....	B.	30867-70.....	4	2,050	2,320	8.39	.82
	Franklin Emery No. 5.....	do.....	B.	23442-43.....	2	2,380	2,440	8.99	.93
	Orient.....	do.....	B.	30266-67.....	2	2,120	2,260	9.73	1.29
	Orient (egg and lump, 32 cars).....	do.....	B.	20080-82, 20723-25.....	2	2,170	2,650	10.22	.76
	Royalton.....	do.....	B.	24192-96.....	5	2,130	2,260	9.30	1.21
	Sesser.....	do.....	B.	30206-08, 30485-86.....	4	2,190	2,480	9.84	1.22
FULTON COUNTY.	West Frankfort.....	do.....	B.	12508-10.....	2	2,150	2,240	8.42	2.00
	Do.....	do.....	B.	30887-89.....	3	2,010	2,170	7.93	1.45
	Do.....	do.....	B.	30882-85.....	4	2,030	2,150	8.68	1.50
	Do.....	do.....	B.	22915-17, 19-20.....	5	2,140	2,520	8.82	1.14
CUBA COUNTY.	Big Creek No. 3.....	No. 5 (Springfield).....	B.	12479-80.....	2	1,890	1,960	13.21	3.62
	Big Creek No. 2.....	do.....	B.	14554-57, 59.....	5	1,890	1,970	12.87	3.56
GALLATIN COUNTY.	Saline, middle mine.....	No. 5.....	B.	23425.....	1	.....	.....	8.55	2.91
	Strong.....	No. 6.....	B.	23426.....	1	.....	.....	9.77	3.15
GRUNDY COUNTY.	Coal City.....	No. 2.....	B.	12447.....	1	.....	1,880	6.71	2.96

TABLE I.—Softening temperatures of coal ash from coals of the United States.—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
I										
ILLINOIS—(Contd.)					2	3	4	5	6	7
M'DONOUGH COUNTY.										
Industry.....	Burdick.....	No. 2.....	B.	15117-18.....	2	2,140	2,240	2,190	7.55	3.26
Plymouth.....	Stoneking.....	do.....	B.	14972-73.....	2	1,970	2,120	2,050	6.76	3.68
M'LEAN COUNTY.										
Bloomington.....	Bloomington.....	No. 2.....	B.	14664-68.....	5	1,960	2,030	2,000	10.82	3.32
MACOUPIN COUNTY.										
Gillespie.....	Superior No. 1.....	No. 6 (Herrin).....	B.	18545-46.....	2	2,140	2,160	2,150	11.36	4.59
Do.....	Superior No. 1 (car sample, run-of-mine).....	do.....	B.	18910.....	1	.....	.....	2,040	15.11	5.76
MADISON COUNTY.										
Collinsville.....	Cantine No. 3.....	do.....	B.	10956-58.....	3	1,970	2,020	1,990	10.67	4.01
MENARD COUNTY.										
Atheus.....	Wabash No. 2.....	No. 5.....	B.	12506-07.....	2	1,890	1,970	1,930	11.47	3.44
MERCER COUNTY.										
Matherville.....	Alden No. 7.....	No. 1.....	B.	14606-11.....	6	2,040	2,180	2,110	11.74	4.86
MONTGOMERY COUNTY.										
Panama.....	Shoal Creek No. 1.....	No. 6.....	B.	21903-05, 01, 11352-53.	6	2,010	2,170	2,060	13.49	4.54
PEORIA COUNTY.										
Bartonville.....	Collier.....	No. 5.....	B.	21032-34.....	3	1,900	1,970	1,950	11.61	3.35
Hanna City.....	Hanna City.....	do.....	B.	22982-85.....	4	1,910	2,030	1,950	13.72	3.42

PERRY COUNTY.		No. 6.	B.	13578-53, 13585-90, 26,462-67.	18	2,330	2,610	2,490	11.18	1.00
Duquoin.....	Paradise.....	No. 6.	B.	13578-53, 13585-90, 26,462-67.	18	2,330	2,610	2,490	11.18	1.00
Do.....	Security No. 1.....	do.	B.	31033-36.....	4	2,050	2,130	2,000	10.50	1.70
Pinekevillle.....	Richcy No. 1.....	do.	B.	14175, 77, 79-81.....	5	1,920	2,170	2,060	11.46	3.65
ST. CLAIR COUNTY.										
O'Fallon.....	Taylor.....	No. 6.	B.	12505, 09.....	2	1,960	2,030	2,000	12.70	5.04
SALINE COUNTY.										
Edorado.....	Dering No. 2.....	No. 5.	B.	33101-03.....	3	1,990	2,100	2,040	9.29	2.76
Grayson.....	Grayson No. 6.....	do.	B.	33091-93.....	3	1,940	2,060	2,020	12.32	4.24
Do.....	Saline No. 6.....	do.	B.	28449.....	1	2,010	2,040	2,020	10.09	4.14
Harrisburg.....	O'Gara No. 3.....	do.	B.	33081-83.....	3	2,010	2,040	2,020	10.09	3.66
Do.....	O'Gara No. 4.....	do.	B.	12516-17, 14110-13, 14138-39.	2	2,020	2,020	2,020	7.87	2.92
Do.....	O'Gara No. 9.....	do.	B.	12795.....	7	1,960	2,210	2,090	7.94	2.15
VERMILION COUNTY.										
Danville.....	Electric.....	No. 7.	B.	13484, 86-89, 91-96.	11	1,940	2,180	2,040	9.70	3.31
Do.....	Schaefer.....	No. 6.	B.	13450-53.....	4	1,990	2,170	2,060	10.19	3.85
Fairmont.....	Fairmont.....	do.	B.	13348-50, 52-54.....	6	1,950	2,150	2,050	11.78	2.76
Georgetown.....	Sharon.....	do.	B.	13467-71.....	5	2,070	2,160	2,100	12.76	2.61
Steaton.....	Dering No. 4.....	do.	B.	13568-69, 71-73, 75-77.	8	2,040	2,190	2,110	10.53	2.55
Westville.....	Bunsen (car sample, nut coal).	do.	B.	25413.....	1	2,180	2,180	2,180	10.45	1.99
Do.....	Bunsen No. 3.....	do.	B.	12445.....	1	1,940	1,940	1,940	11.93	3.74
Do.....	Little Vermilion.....	do.	B.	13436-41, 43-48.....	12	1,930	2,160	2,070	9.84	2.52
WILLIAMSON COUNTY.										
Herrin.....	C. & H. (car sample, run-of- mine).	No. 7.	B.	19714.....	1	2,060	2,060	2,060	11.53	2.06
Do.....	Pond Creek.....	No. 6.	B.	30872-75.....	4	2,010	2,430	2,220	9.43	1.01
Do.....	Rend No. 2.....	do.	B.	28810-14.....	5	2,230	2,390	2,300	8.88	1.08
Do.....	Weaver No. 2.....	do.	B.	30863-65.....	3	1,950	2,280	2,140	9.74	1.41
INDIANA.										
GIBSON COUNTY.										
Fort Branch.....	Fort Branch.....	No. 5.	B.	20365-67.....	3	2,060	2,100	2,080	9.72	3.83
GREENE COUNTY.										
Jasonville.....	Gilmour No. 7.....	No. 4.	B.	31295-98.....	4	2,570	2,790	2,660	8.43	1.33
Linton.....	Vandalia No. 24.....	do.	B.	31278-80.....	3	2,370	2,710	2,500	8.30	1.49
KNOX COUNTY.										
Bicknell.....	Indian Creek.....	No. 5.	B.	18435-36.....	2	2,040	2,210	2,130	10.28	4.83
Bruceville.....	Oliphant Johnson No. 1.....	do.	B.	27632-34, 36, 60-61.	6	2,030	2,130	2,070	11.90	3.51

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
I										
INDIANA (Contd.)										
PIKE COUNTY.										
Winslow.....	Ayrshire No. 7 (car sample, 35 cars, 2-inch lump).	No. 5.....	B.	30228-31.....	4	2,480	2,560	2,530	6.40	1.06
SULLIVAN COUNTY.										
Carlisle.....	Viola.....	No. 5.....	B.	22217-19.....	3	1,990	2,200	2,090	10.20	3.27
Dugger.....	Ayrshire No. 27.....	No. 4.....	B.	31200-43.....	4	2,350	2,710	2,440	8.20	1.42
Do.....	Vandalia No. 10.....	do.....	B.	10060-61, 23225-26, 31262-66.....	9	2,150	2,300	2,200	7.01	1.45
Do.....	Vandalia No. 22.....	do.....	B.	31274-76.....	3	2,030	2,340	2,170	8.91	2.93
Sullivan.....	Vandalia No. 17.....	No. 6.....	B.	31268-72.....	5	2,010	2,120	2,070	9.91	2.65
Do.....	Vandalia No. 28.....	No. 4.....	B.	31282-81.....	3	2,300	2,420	2,350	7.81	1.43
VANDERBURG COUNTY.										
Evansville.....	Sunnyside.....	No. 5.....	B.	20250-51.....	2	2,080	2,100	2,090	10.31	2.97
VERMILION COUNTY.										
Blanford.....	West Clinton No. 1.....	No. 5.....	B.	21874-75.....	2	1,890	2,070	1,990	10.49	3.65
Clinton.....	Clinton No. 4.....	No. 4.....	B.	31277-80.....	4	2,250	2,320	2,280	8.50	1.26
Do.....	Crown Hill No. 3.....	No. 3.....	B.	23212-13, 15-16.....	4	2,040	2,220	2,140	9.92	3.64
Do.....	Dering No. 1.....	do.....	B.	25346-48, 45.....	4	1,990	2,070	2,050	9.83	3.86
VIGO COUNTY.										
Coal Bluff.....	Vigo No. 74.....	Minshall.....	B.	26124.....	1	.....	.....	2,120	9.60	2.99
Liggett.....	Vandalia No. 82.....	No. 3.....	B.	31286-88.....	3	2,030	2,100	2,080	12.08	5.51
Do.....	do.....	No. 5.....	B.	23113-16, 24063-61.....	6	1,950	2,090	2,010	10.82	3.45
WARRICK COUNTY.										
Elberfeld.....	Elberfeld.....	No. 5.....	B.	16578.....	1	.....	.....	2,190	11.83	5.30

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, per centure of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1						3	4	5	6	7
KENTUCKY—Con.										
DAVIESS COUNTY.										
Owensboro.	Fulkerson.	No. 9.	B.	18970-71.	2	2,030	2,080	2,060	12.18	4.31
Do.	George Rudy.	do.	B.	18958-60.	3	2,060	2,190	2,100	10.76	3.63
HARLAN COUNTY.										
Benham.	Benham.	Kellioka (C).	B.	24836.	1	2,510	2,930	2,230	2.21	.49
Harlan.	Clover Fork.	Harlan.	B.	24728-29, 31.	3	2,520	2,550	2,720	2.95	.75
Do.	Coxton.	do.	B.	24714-15.	2	2,520	2,550	2,540	3.52	.88
Do.	Wood.	do.	B.	24770-72.	3	2,600	+3,010	+2,840	5.36	.92
HENDERSON COUNTY.										
Baskett.	No. 1.	No. 9.	B.	18962-64.	3	2,020	2,100	2,050	11.53	3.14
Corydon.	Corydon.	No. 12.	B.	19103-06.	4	1,800	2,030	1,970	12.72	3.39
Henderson.	Nicholson.	No. 9.	B.	18973-74.	2	2,080	2,480	2,280	12.31	3.56
Robards.	Panama.	do.	B.	18976-77.	2	1,960	2,070	2,030	11.41	4.12
Smith Mills.	Smith Mills.	No. 12.	B.	19108-11.	4	1,960	2,140	2,070	9.41	2.03
HOPKINS COUNTY.										
Dawson Springs.	Workman.	Dawson.	B.	19298-301.	4	2,000	2,250	2,100	5.49	3.11
Earlington.	Arnold No. 9.	No. 9.	B.	19204-11.	8	1,980	2,310	2,090	9.96	3.78
Madisonville.	Reincke.	No. 11.	B.	19194-202.	9	1,960	2,310	2,070	7.95	4.00
Neb.	Nelson.	No. 14.	B.	19230-35.	6	1,900	2,380	2,070	9.17	3.02
Nortonville.	Norton No. 1.	No. 11.	B.	19237-42.	6	1,950	2,130	2,040	7.46	3.77
St. Charles.	Cardendale No. 1.	No. 9.	B.	19261-66.	6	1,910	2,190	2,020	9.05	3.59
Do.	Fox Run.	do.	B.	19252-59.	8	1,930	2,170	2,030	10.03	3.43
JOHNSON COUNTY.										
Van Lear.	Van Lear No. 1.	Millers Creek (No. 1).	B.	10548-49.	2	2,010	2,280	2,150	3.50	1.17
Do.	Van Lear No. 2.	do.	B.	10551.	1			2,030	3.54	1.90
Do.	Van Lear No. 3.	do.	B.	10552.	1			2,080	1.54	1.68
Do.	Van Lear No. 4.	do.	B.	10553.	1			2,400	2.46	

KNOX COUNTY.		Bennett No. 1.....	Fireclay (Dean or No. 4).....	B.	21537-39-40.....	3	2,840	2,960	2,910	6.42	-78
		New Hughes.....	Jellico.....	B.	21542-45.....	4	2,360	2,590	2,460	6.92	1.56
LAUREL COUNTY.											
East Barnistead		Bonar.....	Millers Creek (No. 1).....	B.	21429-32.....	4	2,020	2,460	2,220	4.97	2.40
Pittsburg		Acme.....	do.....	B.	21339-42.....	4	1,990	2,120	2,060	7.39	3.70
LETCHER COUNTY.											
Flat Gap (Va.)		Local.....	Lower Standford.....	B.	15172.....	1	.....	.....	2,260	5.24	1.81
Do.....		Mullin.....	Lower Bolling.....	B.	15173.....	1	.....	.....	2,260	16.65	1.01
Fleming.....		Acme.....	Elkhorn.....	B.	29845-46.....	2	2,300	2,390	2,350	3.18	.08
Do.....		Elkhorn No. 301.....	do.....	B.	21308-11.....	4	2,550	2,640	2,590	4.18	.64
Jenkins.....		Consolidation No. 204.....	do.....	B.	14904-05.....	2	2,490	2,660	2,580	4.23	.53
Do.....		Local.....	Lower Elkhorn.....	B.	14970.....	4	2,390	2,510	2,450	3.92	.86
Metcalf.....		Elkhorn or Kona.....	Elkhorn.....	B.	21303-06.....	4	2,390	2,510	2,450	4.16	1.02
McGoberts.....		Consolidation No. 213.....	do.....	B.	21294-97.....	4	2,350	2,670	2,500	3.42	.56
Do.....		Consolidation No. 214.....	do.....	B.	21299-301, 317.....	4	2,430	2,730	2,540	3.79	.60
M'LEAN COUNTY.											
Island.....		O'Neill.....	No. 9.....	B.	19281-84.....	4	1,980	2,170	2,090	10.62	3.48
MUHLENBERG COUNTY.											
Bevier.....		Lam.....	No. 9.....	B.	19331-32, 34-36.....	5	1,870	2,030	1,950	9.83	3.98
Central City.....		Central.....	do.....	B.	13257-59.....	3	1,970	2,230	2,090	8.34	2.87
Cleaton.....		Bevier.....	do.....	B.	13339-41.....	3	1,920	1,960	1,940	10.27	3.60
Graham.....		SKibo.....	do.....	B.	16674-75.....	2	1,970	2,030	2,000	10.20	3.76
OHIO COUNTY.											
McHenry.....		McHenry.....	No. 9.....	B.	15103.....	1	.....	.....	2,120	9.51	2.91
Rockport.....		Crown.....	do.....	B.	19338-43.....	6	1,890	2,120	2,040	11.06	3.77
PERRY COUNTY.											
Domino.....		Himyar.....	Hazzard (Haddix or No. 6).....	B.	21334-37.....	4	2,020	3,010	2,460	8.56	.79
Donatass.....		Donatass.....	Fireclay (Dean or No. 4).....	B.	21304-57.....	4	2,620	+3,010	+2,800	3.55	.74
Hazzard.....		Hazzard.....	do.....	B.	21304-60.....	3	2,910	+3,010	+2,800	3.64	.63
Do.....		Hazzard-Dean.....	do.....	B.	21308-69.....	2	2,370	2,460	+3,120+	4.12	.86
Do.....		Ross-Petrey.....	do.....	B.	21680.....	1	.....	.....	+3,120+	6.16	.64
Leahut.....		North Fork.....	do.....	B.	21339-62.....	4	2,630	+3,010	+2,900	4.24	.87
Lothair.....		Ashless.....	do.....	B.	21349-50, 52.....	3	2,320	2,610	2,490	5.39	.67
Do.....		Kentucky Jewel.....	Flag (No. 7).....	B.	21344-47.....	4	2,730	2,970	2,880	7.52	.83

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, per centage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
I										
2						3	4	5	6	7
KENTUCKY—Con.										
PIKE COUNTY.										
Heller.....	Edgewater.....	Upper Elkhorn.....	B.	12004.....	1.....	.....	.....	2,290	2.75	0.58
Spring (W. Va.).....	Burnwell No. 2.....	Rawl (Gas or No. 2).....	B.	17439.....	1.....	.....	.....	2,940	5.25	.64
Thacker (W. Va.).....	Little Thacker.....	Alum.....	B.	17460.....	1.....	.....	.....	4,310	4.37	.61
Do.....	do.....	Thacker.....	B.	17461.....	1.....	.....	.....	2,430	4.42	1.39
UNION COUNTY.										
Dekoven.....	Banks.....	No. 10.....	B.	23011.....	1.....	.....	.....	1,970	12.56	4.18
Do.....	Curlew.....	No. 9.....	B.	23010.....	1.....	.....	.....	2,000	9.69	3.63
Do.....	Ohio Valley.....	do.....	B.	19169-71.....	6.....	1,990	2,070	2,020	12.32	3.76
Do.....	Syres.....	No. 10.....	B.	23012.....	1.....	.....	.....	2,010	11.42	4.17
Morganfield.....	do.....	No. 11.....	B.	19555-58.....	4.....	1,840	2,230	2,020	11.06	4.46
Spring Grove.....	Buchanan.....	do.....	B.	23013.....	1.....	.....	.....	1,990	9.99	4.02
Sturgis.....	Crittenden.....	No. 6.....	B.	19113-16.....	4.....	1,990	2,260	2,130	8.81	2.97
Do.....	West Kentucky No. 8.....	No. 9.....	B.	19071-75.....	5.....	1,920	2,050	1,980	10.62	4.19
Do.....	West Kentucky No. 9.....	do.....	B.	19081-84.....	4.....	1,980	2,000	1,960	10.62	4.03
Uniontown.....	River Kial.....	No. 11.....	B.	18993-97.....	5.....	1,880	2,050	1,970	10.33	3.96
WEBSTER COUNTY.										
Clay.....	West Kentucky No. 7.....	No. 12.....	B.	19148-53, 30748-50.....	9.....	2,090	2,720	2,410	8.47	1.49
Providence.....	Providence No. 3.....	No. 9.....	B.	19141-46.....	6.....	1,870	2,100	1,960	10.55	4.17
Do.....	Shamrock.....	No. 11.....	B.	19176-81.....	9.....	1,880	2,110	1,970	9.77	4.24
Seabree.....	Seabree.....	No. 9.....	B.	18967-68.....	2.....	1,810	2,020	1,920	11.09	3.86
Wheatcroft.....	West Kentucky No. 4.....	No. 11.....	B.	19119-23.....	5.....	2,020	2,390	2,160	10.45	4.14
WHITLEY COUNTY.										
Barthell.....	No. 1 (North Main).....	No. 2 (Rawl or Gas).....	B.	10662.....	1.....	.....	.....	* 2,340	9.80	3.16

MARYLAND.

ALLEGANY COUNTY.

[illegible]

GARRETT COUNTY.

[illegible]

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1						3	4	5	6	7
MARYLAND— Continued.					6	2,280	2,680	2,540	11.78	2.62
GARRETT COUNTY continued.					1			3,010	10.27	1.04
Dodson.....	Dodson.....	Lower Kittanning.....	S. B.	17047-52.....	1			2,190	11.84	4.11
Do.....	do.....	Upper Kittanning.....	S. B.	17054.....	1			2,710	16.82	1.42
Friendsville.....	McCulloch.....	Lower Kittanning.....	B.	26519.....	1			2,660	10.08	1.47
Gorman.....	Strathmore.....	Upper Freeport.....	S. B.	26523.....	1			2,490	8.23	1.47
Gannons Station.....	Washington No. 5.....	Bakersville.....	S. B.	26531.....	1			2,530	9.53	1.81
Grantsville.....	Beachey.....	Grantsville.....	S. B.	26541.....	1			+ 3,010	8.72	.68
Harrison.....	Dodson No. 3.....	Lower Kittanning.....	S. B.	26513.....	1			2,260	13.74	2.31
Do.....	Dodson No. 5.....	Upper Kittanning.....	S. B.	26537.....	1			2,750	5.95	1.18
Hubbard.....	Apax Hocking No. 1.....	Upper Kittanning.....	S. B.	26515.....	1			2,170	22.72	3.20
Lonaconing.....	Koonz.....	Upper Freeport.....	S. B.	26522.....	1			2,510	8.01	1.49
Oakland.....	Maryland (new opening).....	Lower Kittanning.....	S. B.	26517.....	1			2,130	15.14	4.91
Do.....	Chisholm.....	Lower Kittanning.....	S. B.	26536.....	1			2,410	20.13	4.62
Do.....	Leighton.....	Merer (Mount Savage).....	B.	26538.....	1			2,170	8.63	3.83
Do.....	John Sines.....	Upper Freeport.....	S. B.	26525.....	1			2,150	10.39	2.57
Do.....	Taylor Sines.....	Upper Freeport.....	S. B.	26534.....	1			2,130	10.93	2.51
Do.....	Tower.....	do.....	S. B.	26535.....	1			2,190	11.86	3.85
Swallow Falls.....	Beachley.....	do.....	B.	26535.....	1					
Do.....	Shaeffer.....	Lower Kittanning.....	B.	26518.....	1					
MISSOURI.										
ADAIR COUNTY.										
Connellsville.....	Manufacturers No. 1.....	Bevier.....	B.	10085-87.....	3	1,870	2,100	1,980	14.96	4.10
Kirksville.....	Rocky Ford No. 1.....	do.....	B.	10101-02.....	2	1,980	2,030	2,010	16.11	4.35
Do.....	Star No. 1.....	do.....	B.	10099-100.....	2	1,940	1,950	1,950	15.44	6.13
Do.....	Star.....	do.....	B.	14799-800.....	2	1,990	2,010	2,000	11.07	5.91
Do.....	Star.....	do.....	B.	75561.....	1			2,000	13.56	3.98
Novinger.....	Electric.....	do.....	B.	10075-76, 84.....	1	1,920	1,980	1,960	11.97	4.17
Do.....	Great Northern No. 21.....	do.....	B.	75566.....	1			2,040	23.08	7.85
Do.....	K. C. Midland No. 4.....	do.....	B.	10078, 82-83.....	1	1,870	1,950	1,910	13.96	3.56
Do.....	Rombauer No. 3.....	do.....	B.	10077, 80.....	2	1,950	1,960	1,960	14.62	4.62
Do.....	Consolidated Stahl No. 1.....	Lexington.....	B.	10077, 80.....	2	1,950	1,960	1,960	14.62	4.62

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TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
MISSOURI—Contd.										
HENRY COUNTY—continued.										
Lewis.....	Pigg No. 1.....	Tebo.....	B.	11267-69.....	3	1,960	2,010	1,980	14.24	4.54
Windsor.....	Bowen No. 1.....	Bituminous.....	B.	75554.....	1	.....	.....	1,970	10.51	5.82
Do.....	Bowen.....	Cannel.....	B.	75555.....	1	.....	.....	2,220	14.80	8.18
Do.....	Bowen No. 4.....	Bowen.....	B.	10349-51.....	3	1,920	1,960	1,940	13.18	4.61
JOHNSON COUNTY.										
Sutherland.....	Sutherland No. 1.....	Bevier.....	B.	10346, 48.....	2	1,890	2,060	1,980	9.07	4.44
LAFAYETTE COUNTY.										
Corder.....	Black Diamond.....	Lexington.....	B.	10343-45.....	3	1,960	1,980	1,970	13.00	5.13
Do.....	Wilson.....	do.....	B.	10242-44.....	3	1,950	1,980	1,970	13.25	3.94
Higginsville.....	Farmers No. 1.....	do.....	B.	10239-41.....	3	2,000	2,120	2,040	19.02	3.76
Lexington.....	Graddy.....	do.....	B.	10225-27.....	3	1,830	2,070	1,960	15.00	3.90
Do.....	Summit.....	do.....	B.	75568.....	1	.....	.....	1,950	18.49	4.11
Napoleon.....	Independence.....	do.....	B.	10222-24.....	3	1,990	1,990	1,990	16.59	3.71
Waverly.....	Buckhorn.....	Waverly.....	B.	10341-42, 75567.....	3	1,990	2,030	2,010	16.53	7.37
Wellington.....	Labor Exchange, branch 305.....	Lexington.....	B.	10228-30.....	3	1,990	2,070	2,040	11.54	3.51
LINN COUNTY.										
Brookfield.....	Crandall No. 1.....	Tebo.....	B.	11421-23.....	3	1,950	2,160	2,040	9.51	4.97
Do.....	Walker No. 1.....	do.....	B.	11413-15.....	3	1,830	2,200	2,040	8.82	5.12
Marceline.....	Landreth No. 1.....	do.....	B.	11417-19.....	3	1,960	2,040	2,000	8.49	4.86
MACON COUNTY.										
Admore.....	Bevier No. 2.....	Bevier.....	B.	75565.....	1	.....	.....	1,940	12.43	5.24
Bevier.....	Central No. 61.....	do.....	B.	10191-93.....	3	1,940	2,090	2,030	11.27	3.83
Do.....	Northwestern No. 9.....	do.....	B.	9988-90.....	3	1,920	1,990	1,950	11.12	4.05
Macon.....	Home No. 1.....	Mulky.....	B.	9985-86, 75559.....	3	1,950	2,100	2,050	10.86	4.74

POTAM COUNTY.	Mendota No. 2	Lexington..... do.....	B. B.	11398-400 14880-81	3 2	1,900 2,030	1,940 2,100	1,930 2,070	12.05 13.84	5.05 3.76
RANDOLPH COUNTY.	Carson No. 1..... Northern Central No. 2..... Jacksonville..... Smith Marriott..... Orris No. 1..... Jones No. 1..... Ryder.....	Bevier..... do..... do..... do..... Mulky..... Bevier.....	B. B. B. B. B. B.	11452-54 11448-50 75569 75564 11497-99 10180-82	3 3 1 3 3 3	1,960 1,960 1,960 1,870 1,830	1,980 1,990 1,940 1,930 1,910 1,880	1,970 1,970 1,940 1,910 1,880	11.67 9.95 15.87 14.07 9.23 16.01	6.11 4.46 6.96 5.55 5.14 5.20
RAY COUNTY.	Ray County..... Do..... Ray County No. 50..... Vibbard No. 1.....	Lexington..... do..... do..... do.....	B. B. B. B.	75563 10197-99 10194-96 11365-67	1 3 3 3	1,930 1,990 1,990	2,140 2,030 2,220	2,000 2,010 2,070	14.84 15.84 13.39 9.91	4.73 4.49 4.49 3.14
SULLIVAN COUNTY.	Milan No. 1.....	Bevier.....	B.	10125-26	2	1,850	1,960	1,910	19.49	6.85
VERNON COUNTY.	Jones No. 1.....	Rich Hill.....	B.	11205-07	3	1,930	1,990	1,970	15.47	6.12
MONTANA.	Local prospect..... Lodgegrass..... Sanders.....	Carney..... "M" Prospect.....	Sb. B. Sb. B.	28149 17711	1 1	.....	.....	2,180 2,250	6.52 7.75	.39 .66
BIG HORN COUNTY.	Cook.....	Unnamed.....	Sb. B.	14782	1	.....	.....	2,240	11.51	.90
BLAINE COUNTY.	Western.....	Unnamed.....	B.	28556-57	2	2,350	2,470	2,410	24.38	8.22
BROADWATER COUNTY.	International..... No. 2..... Do..... North Side..... Do..... South Side..... Red Lodge No. 4..... Washoe.....	No. 3..... No. 2..... Do..... Do..... Do..... Do..... Do.....	Sb. B. Sb. B. Sb. B. Sb. B. Sb. B. Sb. B. Sb. B.	18691-93 15146-49, 51 15143 15127-29 29466-69 2,120 29622-25	3 5 1 3 4 4 4	2,010 2,050 2,040 2,110 2,120 2,190 2,090	2,090 2,100 2,110 2,110 2,170 2,190 2,150	2,040 2,080 1,980 2,080 2,150 2,150 2,150	9.44 10.46 9.87 12.90 13.20 12.57 12.57	1.99 1.79 1.73 2.47 1.13 1.25

FLATHEAD COUNTY.	Outcrop.....	Unnamed.....	Sb. B.	12786.....	1	2,210	11.41	2.92
GRANITE COUNTY.	Flathead River.....	Unnamed.....	Sb. B.	10534.....	1	2,370	20.99	1.70
DRUMMOND COUNTY.	Prospect.....	Unnamed.....	Sb. B.	22793.....	1	2,250	22.68	.92
HILL COUNTY.	Prospect.....	do.....	Sb. B.	22796.....	1	2,010	9.46	1.03
	do.....	do.....	Sb. B.	22797.....	1	2,060	14.25	.79
	do.....	do.....	Sb. B.	22799.....	1	2,220	26.72	1.66
	do.....	do.....	Sb. B.	22795.....	1	2,130	20.15	1.00
	Wheatman.....	do.....	Sb. B.	17841.....	1	2,020	12.53	1.52
	Banks & Severn.....	No. 1.....	Sb. B.	17892.....	1	2,060	20.95	1.97
	Outcrop.....	do.....	Sb. B.	17892.....	1	2,320	8.97	1.91
	West Butte.....	Unnamed.....	B.	17842.....	1			
MISSOULA COUNTY.								
MISSOULA.	Hell Gate.....	Unnamed.....	Sb. B.	13541-42.....	2	2,230	26.28	1.08
MUSSELSHELL COUNTY.								
LAVINA.	Bennett.....	Unnamed.....	Sb. B.	19784.....	1	2,220	16.79	1.97
	Caldwell.....	do.....	Sb. B.	19785.....	1	2,910	17.91	1.93
	Sholz.....	do.....	Sb. B.	13114.....	1	2,310	18.37	1.13
	Painted Kock.....	do.....	Sb. B.	17587.....	1	2,260	7.94	.94
	Roundup.....	do.....	Sb. B.	17589.....	1	2,420	8.99	.39
	do.....	do.....	Sb. B.	17586.....	1	2,290	7.60	.45
	Republic No. 2.....	do.....	Sb. B.	28999, 29000, 02-03.....	4	2,330	9.17	.88
	Roundup A.....	do.....	Sb. B.	17588.....	1	2,290	8.15	.67
	Roundup No. 3.....	do.....	Sb. B.		1			
PHILIPS COUNTY.								
Malta.....	Spencer.....	Unnamed.....	L.	27221.....	1	2,450	34.74	.78
ROSEBUD COUNTY.								
Bighorn.....	Prospect.....	Unnamed.....	Sb. B.	14755.....	1	2,240	17.89	1.87
SHERIDAN COUNTY.								
Daleview.....	Ranous.....	Daleview.....	L.	23008.....	1	2,120	15.61	.38
East Sockeye.....	Coal Creek.....	Coal Creek.....	L.	23007.....	1	2,240	15.74	.90
Pennywood.....	Pierce Bros.....	Richardson.....	L.	23595.....	1	2,340	11.47	.72
TETON COUNTY.								
Browning.....	Stone Prospect.....	Unnamed.....	B.	12602.....	1	2,790	13.53	1.09
Cut Bank.....	Allison Prospect.....	do.....	B.	12404.....	1	2,590	30.08	1.93
do.....	Prospect.....	do.....	B.	14109.....	1	2,230	21.54	.71
do.....	do.....	do.....	B.	12427.....	1	2,140	14.87	3.30
Blair.....	do.....	do.....	B.		1			

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
MONTANA—Con.										
VALLEY COUNTY.										
Antelope.....	Richardson.	Richardson.....	L.	14614.	1	.....	.....	2,120	10.43	0.44
Bainville.....	Red Bank.	"G".....	L.	10898.	1	.....	.....	2,470	8.11	.42
Culbertson.....	Bruegger.	"E".....	L.	10724.	1	.....	.....	2,170	13.50	1.90
Do.....	Butterfield.	"DD".....	L.	10727.	1	.....	.....	2,260	9.70	.51
Do.....	Dempsey.	"E".....	L.	10725.	1	.....	.....	2,350	10.19	1.23
Do.....	Prospect.	"F".....	L.	10726.	1	.....	.....	2,350	11.95	1.75
East Scobey.....	Fisher.	Unnamed.	L.	23005.	1	.....	.....	2,210	14.86	.49
Froid.....	Astrophe.	"F".....	L.	11005.	1	.....	.....	2,220	10.51	1.22
Do.....	Prospect.	"F".....	L.	11004.	1	.....	.....	2,280	8.85	1.20
Medicine Lake	Belgon.	Unnamed.	L.	10899.	1	.....	.....	2,390	8.23	.61
Do.....	Coal Ridge.	Coal Ridge.	L.	11002.	1	.....	.....	2,250	12.60	.65
Do.....	Jones.	Do.....	L.	11006.	1	.....	.....	2,390	9.54	.69
Do.....	Young.	Young.....	L.	11003.	1	.....	.....	2,360	9.46	.87
Montak.....	Open pit.	G.....	L.	10800.	1	.....	.....	2,280	6.99	.63
Ophelim.....	Baldwin.	Ophelim.	L.	23006.	1	.....	.....	2,080	13.21	.96
Do.....	Dawson.	Unnamed.	L.	23025.	1	.....	.....	2,150	13.11	.54
Plentywood.....	Pierce.	Richardson.	L.	14670.	1	.....	.....	2,340	12.31	1.00
NEVADA.										
ESMERALDA COUNTY.										
Coaldale.....	Darms.	"C".....	B.	13978.	1	.....	.....	2,480	31.16	7.33
Do.....	Nevada.	"C".....	B.	13980, 14409.	2	2,200	2,570	2,380	23.88	7.14
MINERAL COUNTY.										
Yerington (Lyon County).	Prospect.....	Unnamed.	Sb. B.	30792.	1	.....	.....	2,190	38.31	4.21
NEW MEXICO.										
BERNALILLO COUNTY.										
Albuquerque.....	Holmes.	Unnamed.	B.	12650.	1			2,330	31.65	3.29

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TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analyses of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
NEW MEXICO—Continued.										
SAN JUAN COUNTY.										
Durango (Colo.).	New Mexico.	"A."	B.	17749.	1				11.06	0.71
Farlington.	Bill Thomas.	Carbonero.	B.	29249.	1				2.940	11.68
Do.	Blake.	Unnamed.	Sb. B.	23003.	1				2.220	6.68
Do.	Government.	Hogback.	B.	17750.	1				2.230	3.46
Do.	Jones.	Carbonero.	B.	29250.	1				2.870	12.80
Do.	Local.	Unnamed.	Sb. B.	23085.	1				2.860	8.31
Do.	Marcellus.	Carbonero.	Sb. B.	29025.	1				2.850	9.13
Do.	Prospect.	do.	Sb. B.	23026.	1				2.150	14.02
Do.	do.	Carbonero (?)	Sb. B.	23007.	1				2.290	7.68
Do.	Ship Rock Indian School.	Unnamed.	Sb. B.	23006.	1				2.270	4.64
Fruitland.	Black Diamond.	Carbonero.	Sb. B.	22508.	1				2.310	11.19
Do.	Hendrickson.	do.	Sb. B.	22509.	1				2.720	10.33
Do.	Pueblo Bonita.	Unnamed.	Sb. B.	23004.	1				2.650	8.78
SANTA FE COUNTY.										
Madrid.	Anthracite No. 4.	White Ash.	A.	14886.	1				2.210	10.08
Do.	Blacksmith.	Peacock (?)	B.	14884.	1				2.500	7.97
Do.	Peacock prospect.	Peacock.	B.	14887.	1				2.130	11.37
SOCORRO COUNTY.										
Carthage.	Government.	Carthage.	B.	30214-15.	2	2,760	2,960		2.860	14.35
Magdalena.	Prospect.	Unnamed.	Sb. B.	29007.	1				2.250	12.24
Do.	do.	do.	Sb. B.	17728.	1				2.680	13.26
Do.	do.	do.	B.	17602.	1				2.220	7.58
NORTH DAKOTA.										
ADAMS COUNTY.										
Haynes.	Nipper & Monroe.	Haynes.	L.	14542.	1				2.270	12.31
Do.	William Pinkham.	do.	L.	1544.	1				2.140	12.68

BOWMAN COUNTY.	Durkin prospect.	L.	14857.	1	2,060	10.96	1.15
	Open pit.	L.	14553.	1	2,130	18.39	
	Scranton.	L.	14485.	1	2,180	12.47	1.01
MERCER COUNTY.							
	Beulah.	L.	33069.	1	2,270	9.51	1.07
	Volmer.	L.	33068.	1	2,140	9.75	.66
	Teubert.	L.	33067.	1	2,390	9.02	1.10
MORTON COUNTY.							
	Ramsland.	L.	19786.	1	2,290	9.17	.64
	Hebron.	L.	32442-43.	2	2,030	13.14	1.56
	Kobank.	L.	17537.	1	2,090	16.13	2.30
	Leth.	L.	14729.	1	2,150	13.63	1.07
	Jones.	L.	20033.	1	2,100	11.84	2.13
	Dakota Products.	L.	34524-25.	2	2,370	10.22	1.40
	New Salem No. 1.	L.	19801.	1	2,180	12.83	1.07
	Unnamed.	L.					
WARD COUNTY.							
	Conon.	L.	31702-04.	3	2,130	16.53	.40
WILLIAMS COUNTY.							
	Bruegger.	L.	12587.	1	2,240	7.39	.51
	Pittsley.	L.	29251, 53.	2	2,280	8.02	.62
	Ray.	L.	12411.	1	2,270	11.90	2.41
	Geltz.	L.	29252.	1	2,430	14.63	2.28
	Jim Monuen.	L.	19370-71, 917, 18.	4	2,000	11.75	1.82
	Husebye-Ellithorpe.	L.	12588.	1	2,190	9.28	1.24
	Powal.	L.	12533, 19365-66, 19921-22.	5	2,310	10.19	.98
	Do.	L.					
	U. S. Reclamation.	L.					
OHIO.							
BELMONT COUNTY.							
	Shipman.	B.	20237.	1	2,060	18.46	4.20
	Moore.	B.	20238.	1	2,320	21.90	2.98
	Do.	B.	20239.	1	2,390	15.14	2.71
	Stoffel.	B.	20187-88.	2	1,960	9.35	4.64
	Cochran No. 2.	B.	20176.	1	2,490	11.72	3.82
	Barnesville.	B.	20241.	1	2,370	15.44	3.16
	Davy.	B.	20174.	1	2,370	16.95	3.69
	Thomas.	B.	20775.	1	2,010	16.10	2.99
	Milhoan.	B.	34002-04.	3	2,040	16.15	3.58
	Do.	B.	20230.	1	2,280	9.86	4.75
	Kemp.	B.					
	Do.	B.					
	Laughlin.	B.					
	Martins Ferry.	B.					
	Somerton.	B.					
	Temperanceville.	B.					

OHIO.

BELMONT COUNTY.								
Alledonia.....	Shipman.....	Meigs Creek (Sewickley).....	B.	20237.....	1.....	2,060.....	18.46.....	4.20.....
Do.....	Moore.....	Washington.....	B.	20238.....	1.....	2,520.....	21.90.....	2.98.....
Do.....	Stoffel.....	Waynesburg.....	B.	20239.....	1.....	2,390.....	15.14.....	2.71.....
Bailey Mills.....	Codran No. 2.....	Pittsburgh (No. 8).....	B.	20187-88.....	2.....	1,960.....	9.35.....	4.64.....
Barnesville.....	Davy.....	Meigs Creek (Sewickley).....	B.	20176.....	1.....	2,490.....	11.72.....	3.82.....
Boston.....	Thomas.....	Waynesburg.....	B.	20241.....	1.....	2,370.....	15.44.....	3.16.....
Hunter.....	Milhoan.....	do.....	B.	20174.....	1.....	2,370.....	16.95.....	3.69.....
Do.....	Kemp.....	Uniontown.....	B.	20175.....	1.....	2,160.....	16.10.....	2.99.....
Martins Ferry.....	Laughlin.....	Pittsburgh (No. 8).....	B.	34002-04.....	3.....	2,040.....	8.82.....	3.58.....
Somerton.....	Brown.....	Waynesburg.....	B.	20234.....	1.....	2,460.....	16.15.....	3.03.....
Temperanceville.....	Jeffries.....	Pittsburgh (No. 8).....	B.	20230.....	1.....	2,280.....	9.86.....	4.75.....

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
OHIO—Continued.					2	3	4	5	6	7
COLLUMBIAN COUNTY.										
East Liverpool.	Delaney	Middle Kittanning.	B.	25592	1			2,430	4.82	1.53
Do.	Duck	do.	B.	25589	1			2,220	6.31	2.18
Do.	Gaston.	Upper Freeport (No. 7)	B.	25583	1			2,650	9.44	4.23
Do.	Johnson.	Middle Kittanning.	B.	25588	1			2,600	7.80	1.88
Do.	Kinsey.	Lower Freeport.	B.	25585	1			2,300	10.86	4.66
Do.	Malone.	Lower Kittanning.	B.	25590	1			2,400	11.94	8.25
Do.	Moore.	Lower Freeport.	B.	25586	1			2,470	12.16	3.18
Do.	Smith.	Middle Kittanning.	B.	25584	1			2,120	6.51	2.72
Do.	McClain.	Upper Freeport (No. 7)	B.	25892	1			2,030	11.32	4.43
New Salisbury.	Answorth.	Lower Kittanning.	B.	25898	1			2,060	5.18	3.86
Do.	Dangelo.	Mahoning.	B.	25896	1			2,440	6.59	3.67
Do.	Householder.	Upper Freeport (No. 7)	B.	25894	1			2,520	8.73	3.98
Do.	Scheckler.	Lower Freeport.	B.	25895	1			2,400	12.25	1.58
Do.	Smith.	Upper Freeport (No. 7)	B.	25893	1			2,000	7.75	2.96
Do.	Woester.	Lower Kittanning.	B.	25897	1			2,060	8.92	5.87
Do.	do.	Middle Kittanning.	B.	25900	1			2,600	11.13	7.72
West Point.	West Point.	Upper Freeport (No. 7)	B.	25881	1			2,240	8.29	3.79
GUERNSEY COUNTY.										
Hartford.	Andy Slovak.	Anderson (Bakerstown).	B.	20243	1			2,120	10.86	3.92
Do.	Walshonding No. 2.	Upper Freeport (No. 7).	B.	20245-46	2	2,400	2,570	2,520	5.91	.92
Lore City.	Black Top.	do.	B.	20264-65	2	2,280	2,300	2,290	7.92	2.01
Quaker City.	Sayre.	Pittsburgh (No. 8).	B.	20178	1			2,180	9.14	5.07
Seneca ville.	Cleveland.	Upper Freeport (No. 7)	B.	20261-62	2	2,330	2,460	2,400	8.43	2.02
JEFFERSON COUNTY.										
Amsterdam.	Amsterdam.	Lower Freeport.	B.	10533, 15388-90	4	2,060	2,190	2,120	7.66	3.03
Do.	Eastern Ohio.	do.	B.	15391-93	3	2,030	2,260	2,150	9.12	2.92
Do.	Elizabeth.	do.	B.	15440-41, 43	3	2,120	2,210	2,170	7.91	3.13
Do.	do.	do.	B.	15563-64	2	2,170	2,190	2,180	8.04	3.94
Do.	Goucher No. 2	Pittsburgh (No. 8)	B.		2					

Cream City	Middle Kittanning	B.	25899	1	1	2,410	11.45	2.13
Empire	Pittsburgh (No. 8)	B.	25784	1	2	2,150	9.67	4.15
Hopedale	do.	B.	15444-45	1	1	2,210	8.11	2.91
Irondale	Upper Freeport (No. 7)	B.	25788	1	1	2,210	8.82	2.98
Do.	Lower Kittanning	B.	25901	1	1	1,960	10.90	5.07
Piney Fork	Pittsburgh (No. 8)	B.	15491	1	1	2,710	4.86	.89
Do.	do.	B.	15480	1	1	2,120	7.62	2.73
Do.	do.	B.	15490	1	1	2,630	5.80	.81
Smithfield	do.	B.	15488	1	1	2,160	7.26	2.68
Staubenville	Lower Freeport	B.	15675	2	2	2,200	7.42	1.99
Yellow Creek	Pittsburgh (No. 8)	B.	25788	1	1	2,170	10.34	4.08
Do.	Upper Freeport (No. 7)	B.	25890-91	2	2	2,240	8.22	3.54
MONROE COUNTY.								
Coats Station	Uniontown	B.	20259	1	1	2,290	16.10	4.16
NOBLE COUNTY.								
Belle Valley	(No. 7)	B.	17213-14	2	2	2,240	8.71	3.13
Mount Ephraim	Moks Creek (Sowickley)	B.	20235	1	1	2,320	10.81	4.32
Quaker City	do.	B.	20185	1	1	2,460	13.17	3.77
Steamtown	do.	B.	20240	1	1	2,310	10.92	5.05
OKLAHOMA.								
COAL COUNTY.								
Lehigh	Folsom Morris No. 5	B.	30707-11	5	5	2,120	12.89	4.56
Do.	Folsom Morris No. 8	B.	30713-17	5	5	2,150	12.20	4.19
Do.	do.	B.	10064	1	1	2,160	11.66	3.92
Phillips	do.	B.	30719-23	5	5	2,190	9.30	3.76
CRAIG COUNTY.								
Bluejacket	Unnamed	B.	20716	1	1	2,160	10.61	6.34
Escala	do.	B.	20718	1	1	2,050	10.68	6.39
Vinita	do.	B.	20717	1	1	2,110	10.51	6.83
Welch	do.	B.	20715	1	1	2,040	12.33	6.06
HASKELL COUNTY.								
McCurtain	Panama	B.	29840-41	2	2	2,130	6.13	1.01
Do.	do.	B.	29839, 42	2	2	2,100	7.49	.91
Do.	Blue Ridge No. 5	B.	10057, 13688-92	6	6	1,990	6.92	.84
Stigler	Turner strip pit	B.	17646	1	1	1,910	4.00	.64
Do.	do.	B.	26323	1	1	2,080	2.62	.65
Do.	do.	B.	30344	1	1	2,050	4.69	.71
Tamaha	Strip pit	B.	30706	1	1	1,920	8.09	3.60
Do.	Old Slope	B.	26324	1	1	2,350	6.25	3.95
Do.	Nunnally strip pit	B.	26324	1	1	2,350	6.25	3.95
Whitefield	Lagon strip pit	B.	26325	1	1	2,000	2.62	1.44

TABLE 1.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1						3	4	5	6	7
OKLAHOMA— (continued.)										
LATIMER COUNTY.										
Adamson.	Adamson No. 6.	Lower Hartshorne.	B.	19852-53.	2	1,920	1,990	1,960	3.21	1.38
Gowen.	Rock Island No. 40.	do.	B.	30276-76.	7	1,910	2,070	2,030	6.86	1.46
Wilburton.	Degnan-McConnell No. 5.	Upper Hartshorne.	B.	27331-31.	4	2,020	2,340	2,190	5.16	.98
LE FLORE COUNTY.										
Bokoshe.	Slope No. 3.	Hartshorne.	S. B.	26801-02.	2	2,220	2,300	2,270	5.12	.78
Hughes (Latimer County).	Turkey Creek No. 2.	do.	B.	10065.	1	.....	.....	2,050	6.46	.89
Williams.	Williams No. 1.	do.	S. B.	19673-77.	5	1,870	2,020	1,970	8.85	1.02
OKMULGEE COUNTY.										
Henryetta.	Victoria No. 1.	Henryetta.	B.	10177-78.	2	1,960	2,000	1,980	8.03	1.59
PITTSBURG COUNTY.										
Adamson.	Eclipse No. 1.	Lower Hartshorne.	B.	16143-44.	2	2,030	2,060	2,050	4.16	1.42
Alderson.	Rock Island No. 5.	McAlester.	B.	11915-17, 30693-06.	10	2,030	2,280	2,190	4.92	.71
Do.	Rock Island No. 38.	do.	B.	11392, 94, 11670, 15188-89, 30650-58.	8	1,950	2,160	2,060	5.28	.56
Buck.	Buck No. 22.	Upper Hartshorne.	B.	26150.	1	.....	.....	2,300	4.78	1.68
Craig.	Bolen-Darnall No. 4.	McAlester.	B.	15101-05.	2	2,200	2,220	2,210	5.39	.87
Haileyville.	Blue Creek No. 7.	Lower Hartshorne.	B.	30401-02.	2	2,060	2,060	2,060	6.02	2.31
Do.	Hailey-Ola No. 2.	Upper Hartshorne.	B.	30398-99.	2	2,060	2,130	2,110	8.50	1.86
Hartshorne.	Rock Island No. 8.	Lower Hartshorne.	B.	10053, 19703.	2	1,990	2,030	2,010	7.70	1.84
McAlester.	Bushy No. 5.	McAlester.	B.	11569, 88-90.	6	2,190	2,270	2,230	5.40	1.58
Pittsburg.	McAlester Edwards No. 1.	do.	B.	10060.	1	.....	.....	2,080	8.07	3.38
Peachontas.	Peachontas No. 1.	Lower Hartshorne.	B.	19728.	1	.....	.....	2,030	8.12	3.81
Ridgeway.	Rock Island No. 10.	do.	B.	30222-26.	1	1,980	2,120	2,050	7.77	1.70

ROGERS COUNTY.	Catale No. 1.....	Unnamed.....	B.	20780.....	1	2,160	10.25	5.40
	McNutt.....	do.....	B.	20781.....	1	2,230	5.10	.89
	New State strip pit.....	Dawson.....	B.	20714.....	1	1,860	8.73	4.09
SEQUOYAH COUNTY.								
Hanson.....	Brewer strip pit.....	Unnamed.....	S. B.	26800.....	1	2,170	5.76	1.82
TULSA COUNTY.								
Dawson.....	Southwestern No. 1.....	Dawson.....	B.	20712.....	1	1,920	9.36	3.62
Tulsa.....	Hickory No. 2.....	do.....	B.	20713.....	1	1,970	8.75	4.01
WAGONER COUNTY.								
Broken Arrow.....	Arkansas Valley strip pit.....	Unnamed.....	B.	20832.....	1	1,960	7.25	2.75
Red Bird.....	Kirk strip pit.....	do.....	B.	26348.....	1	2,080	14.21	6.78
OREGON.								
CLACKAMAS COUNTY.								
Willhoit.....	Prospect.....	Unnamed.....	B. (?)	22492.....	1	2,880	22.04	.53
COOS COUNTY.								
Beaver Hill.....	Beaver Hill.....	Newport.....	Sb. B.	27951.....	1	2,060	11.59	.94
Henryville.....	Henryville.....	do.....	Sb. B.	27956.....	1	2,060	9.79	.86
West Fork.....	Cabin prospect.....	Unnamed.....	B.	17707.....	1	2,780	16.86	1.46
Do.....	Do.....	do.....	B.	17706.....	1	2,790	29.71	1.14
Do.....	Everett Association prospect.....	Meyers.....	B.	17708.....	1	2,500	23.93	1.52
Do.....	Hillis prospect.....	Anderson.....	B.	14827.....	1	2,280	16.92	1.70
Do.....	Meyers prospect.....	Meyers.....	B.	17705.....	1	2,490	26.69	1.85
Do.....	Pulford prospect.....	Anderson.....	B.	19877-78.....	2	2,500	32.26	.93
Do.....	Reeves prospect.....	Carter.....	B.	17704.....	1	2,690	40.70	.62
GRANT COUNTY.								
Dayville.....	Old prospect.....	Unnamed.....	L.	18125.....	1	2,250	47.65	2.16
MALHEUR COUNTY.								
Nyssa.....	Honolulu prospect.....	Unnamed.....	L.	12585.....	1	2,420	45.63	3.82
WHEELER COUNTY.								
Fossil.....	Dry Hollow prospect.....	Unnamed.....	Sb. B.	18126-27.....	2	2,580	37.60	.54

TABLE I.—Softening temperatures of coal ash from coals of the United States—(continued).

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						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
PENNSYLVANIA.										
ALLEGHENY COUNTY.										
Bruceston.....	U. S. experimental.....	Pittsburgh.....	B.	11985, 12282, 12557, 22618.	4	2, 280	2, 510	2, 400	6.82	1.23
Campbell.....	New Field No. 1.....	Lower Freeport.....	B.	32253.	1	.....	.....	2, 440	6.16	1.52
Do.....	do.....	Upper Freeport.....	B.	32256.	1	.....	.....	2, 180	9.04	1.72
Do.....	do.....	Upper and Lower Freeport.....	B.	32258-59.	2	2, 010	2, 150	2, 080	7.77	2.76
Creighton.....	do.....	do.....	B.	26932-34, 90-91.	5	2, 360	2, 960	2, 360	10.06	1.25
Hite.....	do.....	do.....	B.	11130, 32.	2	2, 410	2, 520	2, 470	6.73	1.01
Elizabeth.....	Patterson No. 2.....	Pittsburgh.....	B.	20032, 34.	2	2, 300	2, 580	2, 440	6.04	1.80
Oak Station.....	Oak.....	do.....	B.	10845.	1	.....	.....	2, 450	6.13	1.22
ARMSTRONG COUNTY.										
Applewood.....	Snyder.....	Lower Kittanning.....	B.	29464-65.	2	2, 080	2, 220	2, 160	10.38	4.22
Ford City.....	Campbell.....	Upper Kittanning.....	B.	30294-91.	2	2, 000	2, 030	2, 020	17.75	5.04
Logansport P. O. (Glen Station). Adrian P. O. (Montgomeryville). West Kittanning..... Yatesboro.....	Baridan..... Montgomeryville..... Neals..... Cowanshannock No. 2.....	Upper Freeport..... Middle Kittanning..... Lower Freeport..... do.....	B. B. B. B.	29657-68. 28774-75. 28721-22. 28672-73.	2 2 2 2	2, 140 2, 300 2, 070 2, 050	2, 170 2, 360 2, 070 2, 100	2, 160 2, 330 2, 070 2, 080	10.80 28.80 10.06 10.88	3.29 3.72 3.28 3.20
BEAVER COUNTY.										
Cannelton.....	Beaver Cannel.....	No. 4 (Brookville).....	B.	34650-51.	2	1, 960	2, 090	2, 030	7.12	3.10
Do.....	Cannelton.....	No. 7 (Upper Freeport).....	B.	34656-57.	2	1, 980	2, 160	2, 070	6.57	2.10
Do.....	Robin Hood.....	No. 6 (Middle Kittanning).....	B.	34637-38.	2	2, 130	2, 230	2, 180	5.12	1.03
Do.....	Saratoga.....	No. 3 (Lower Mercer).....	B.	34653-54.	2	1, 960	2, 090	2, 030	15.06	4.51
Smiths Ferry.....	Island Run.....	Upper Freeport.....	B.	25587.	1	.....	.....	2, 250	5.09	1.45
BEDFORD COUNTY.										
Hopewell.....	Cambria No. 3.....	Upper Freeport.....	S. B.	15055-59.	5	2, 460	3, 010	2, 670	12.45	2.01

BLAIR COUNTY.	Glen White No. 2.	Upper Freeport.	3	2,120	2,460	2,240	6.87	1.96
Do	Glen White No. 2 (car sample).	do	1			2,120	9.61	1.96
BRADFORD COUNTY.								
BUTLER COUNTY.								
Long Valley	Clarion		2	3,000	+3,000	+3,000	11.99	1.10
Bruin.	Brookville.							
Muniz.	Upper Freeport.		2	2,220	2,480	2,350	11.51	2.47
Bulter.	Upper Kittanning.		1			2,030	7.75	3.07
Do.	Upper Kittanning.		1			2,230	7.33	2.09
Do.	Vogey.		1			2,050	9.90	3.73
Do.	Upper Kittanning.		2	3,010	+3,010	+3,010	4.54	.90
Zenith No. 1.	Upper Freeport.		1			3,000	8.67	1.26
Cunningham.	Middle Kittanning.		1			2,130	13.97	3.89
Stage.	Middle Kittanning.		1			2,110	5.55	3.71
Young Shaft.	Upper Freeport.		1	2,430	2,560	2,500	14.33	3.65
Annandale No. 2.	Brookville and Clarion.		4			2,050	11.56	4.54
North Pittsburgh Realty.	Middle Kittanning.		1	2,020	2,360	2,190	11.37	2.98
Victoria.	Upper Freeport.		1			2,150	8.41	1.32
Reamer.	do		1			1,990	10.77	3.92
Nealy.	Middle Kittanning.		1			2,220	6.50	2.67
Unionville.	Upper Freeport.		1					
CAMBERA COUNTY.								
Barnesboro.	Cymbria No. 1.		5	2,340	2,570	2,470	6.57	1.50
Do.	Cymbria No. 2.		4	2,410	2,490	2,410	8.48	1.54
Do.	Delta.		4	2,410	2,540	2,490	6.70	1.32
Beaverdale.	Upper Freeport.		6	2,070	2,090	2,380	8.49	1.81
Do.	Beaver Run.		2	2,010	2,300	2,250	8.49	2.73
Do.	Logan No. 6.		4	2,250	+2,250	+2,250	7.26	3.42
Do.	Pennsylvania No. 15.		5	2,130	2,470	2,280	7.97	2.98
Do.	Wilmore No. 1.		5	1,990	2,430	2,270	7.75	2.24
Do.	Wilmore No. 3.		4	2,450	+2,450	+2,450	1.14	1.14
Do.	Colver.		9	3,010	+3,010	+3,010	4.82	.66
Do.	Hennetta.		5	2,380	+2,380	2,610	6.81	1.37
Do.	Peerless No. 1.		5	2,270	+2,270	2,300	10.03	1.78
Do.	Peerless No. 4.		2	2,330	2,330	2,330	6.27	1.41
Do.	Fallen Timber.		4	2,280	2,390	2,390	7.19	1.47
Do.	Gallatin.		1			2,490	8.79	1.46
Do.	Gallatin (car sample).		5	2,430	2,640	2,540	7.14	1.46
Do.	Pennsylvania No. 11.		5	2,200	2,580	2,580	7.63	1.80
Do.	Pennsylvania No. 12.		3	2,240	2,260	2,210	9.71	2.19
Do.	Smokless No. 1.		4	2,240	2,450	2,340	10.40	2.47
Do.	Sunnyside.		3	3,010	+3,010	+3,010	6.36	.67
Do.	Sunnyside.		3	3,010	+3,010	3,000	4.93	.72
Do.	Sunnyside.		4	2,960	3,010	2,960	6.47	1.84
Do.	Sunnyside.		11	2,160	2,480	2,370	7.75	2.15
Do.	Sunnyside.		1			2,150	7.75	2.15
Do.	Sunnyside.		5	2,080	2,280	2,110	6.68	2.15
Do.	Sunnyside.		10	2,260	+2,260	+2,260	3.010	1.15
Do.	Sunnyside.		4	2,230	2,580	2,380	7.65	2.07

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Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
PENNSYLVANIA										
—continued.										
CAMBRIA COUNTY—										
—continued.										
St. Michael.	Maryland.	do.	S. B.	25717-22, 30118-19, 27, 29, 68185, 87, 93, 68219-20.	15	2, 630	+3, 010	+2, 880	6.13	.93
Sonman.	Sonman Slope.	Upper Freeport.	S. B.	26398-403.	6	2, 050	2, 280	2, 170	6.44	1.78
Spangler.	Pennsylvania No. 21.	Lower Freeport.	B.	12144-47.	4	2, 240	+3, 010	+2, 550	6.49	1.32
Do.	Pennsylvania No. 22.	do.	B.	12120-27, 40-42.	5	2, 530	2, 880	2, 620	6.57	1.27
Van Orner.	Peerless No. 1.	Upper Freeport.	B.	10273-77.	3	2, 420	3, 010	2, 760	8.94	.86
Do.	Peerless No. 2.	Lower Freeport.	B.	10272-74.	3	2, 330	2, 500	2, 410	10.38	2.12
Vindondale.	Vinton No. 6.	Lower Kittanning.	S. B.	10254, 36, 57.	3	2, 100	2, 410	2, 310	6.95	2.08
Windber.	Eureka No. 40.	do.	S. B.	68179, 90-91, 204, 206-08, 222.	8	2, 520	+3, 010	+2, 650	7.38	1.22
CAMERON COUNTY.										
Sterling Run.	Berry.	Freeport.	B.	75467-68.	2	2, 850	2, 940	2, 900	6.45	.76
CENTER COUNTY.										
Clarence.	Lehigh Valley No. 22.	Brookville.	B.	17447.	1	.....	.....	+3, 010	14.85	1.01
Do.	Poormansite.	Lower Freeport.	S. B.	17445.	1	.....	.....	2, 220	8.08	1.86
Do.	do.	Lower Kittanning.	B.	17444.	1	.....	.....	+3, 010	12.83	.91
Gillingtown.	Lehigh Valley No. 15.	Lower Freeport.	B.	17446.	1	.....	.....	2, 300	11.64	2.75
Oscoda Mills.	Electric.	Lower Kittanning.	S. B.	12067-70.	4	2, 370	+3, 010	+2, 680	7.96	2.07
Do.	Moshannon No. 10.	do.	S. B.	12057-61.	5	2, 380	2, 550	2, 470	7.52	2.11
Do.	Weston.	do.	S. B.	12063-65.	3	2, 450	2, 690	2, 580	7.93	2.11
CLARION COUNTY.										
Church Hill.	Church Hill.	Lower Kittanning.	B.	34825-26.	2	2, 340	2, 320	2, 330	10.24	2.59
Hillville.	Blue Goose.	do.	B.	34837-38.	2	2, 210	2, 270	2, 240	8.94	3.56
Monterey.	Monterey.	Clarion.	B.	34828-29.	2	2, 120	2, 190	2, 160	7.63	3.58
Parker.	Clarion River.	Upper Kittanning (?)	B.	34822-23.	2	2, 060	2, 270	2, 170	8.31	4.69
Phillipsston.	James.	Lower Kittanning.	B.	34831-32.	2	2, 300	2, 310	2, 310	7.38	3.10
Parrah Furnace.	Sarah Furnace.	do.	B.	34834-35.	2	2, 140	2, 180	2, 160	8.45	3.37

CLEARFIELD COUNTY.		CLINTON COUNTY.		ELK COUNTY.	
Berwindale.	Read.	Lower Freeport.	B.	22535-39.	2,200
Bordman.	Potts Run No. 3.	Lower Kittanning.	S.B.	12933-97.	2,850
Brisban.	Leisure No. 1.	Upper Freeport.	B.	12946.	2,640
Do.	Do.	do.	B.	12944-45.	2,500
Do.	Do.	do.	B.	20342-43, 494-96.	2,620
Do.	Do.	do.	B.	20338-41.	2,280
Do.	Do.	do.	B.	20338-41.	2,777
Do.	Do.	do.	B.	20338-41.	2,553
Do.	Do.	do.	B.	20338-41.	2,96
Do.	Do.	do.	B.	20338-41.	10,56
Do.	Do.	do.	B.	20338-41.	8,87
Do.	Do.	do.	B.	20338-41.	4,76
Do.	Do.	do.	B.	20338-41.	6,92
Do.	Do.	do.	B.	20338-41.	7,75
Do.	Do.	do.	B.	20338-41.	1,02
Do.	Do.	do.	B.	20338-41.	1,98
Do.	Do.	do.	B.	20338-41.	2,05
Do.	Do.	do.	B.	20338-41.	8,82
Do.	Do.	do.	B.	20338-41.	1,56
Do.	Do.	do.	B.	20338-41.	3,23
Do.	Do.	do.	B.	20338-41.	3,39
Do.	Do.	do.	B.	20338-41.	13,48
Do.	Do.	do.	B.	20338-41.	12,75
Do.	Do.	do.	B.	20338-41.	8,61
Do.	Do.	do.	B.	20338-41.	1,42
Do.	Do.	do.	B.	20338-41.	5,50
Do.	Do.	do.	B.	20338-41.	1,63
Do.	Do.	do.	B.	20338-41.	3,54
Do.	Do.	do.	B.	20338-41.	8,94
Do.	Do.	do.	B.	20338-41.	1,41
Do.	Do.	do.	B.	20338-41.	1,98
Do.	Do.	do.	B.	20338-41.	2,08
Do.	Do.	do.	B.	20338-41.	3,10
Do.	Do.	do.	B.	20338-41.	2,61
Do.	Do.	do.	B.	20338-41.	9,95
Do.	Do.	do.	B.	20338-41.	2,44
Do.	Do.	do.	B.	20338-41.	9,99
Do.	Do.	do.	B.	20338-41.	4,05
Do.	Do.	do.	B.	20338-41.	1,10
Do.	Do.	do.	B.	20338-41.	1,03
Do.	Do.	do.	B.	20338-41.	1,99
Do.	Do.	do.	B.	20338-41.	2,91
Do.	Do.	do.	B.	20338-41.	9,43
Do.	Do.	do.	B.	20338-41.	2,130
Do.	Do.	do.	B.	20338-41.	2,300
Do.	Do.	do.	B.	20338-41.	2,850
Do.	Do.	do.	B.	20338-41.	2,640
Do.	Do.	do.	B.	20338-41.	2,500
Do.	Do.	do.	B.	20338-41.	2,620
Do.	Do.	do.	B.	20338-41.	2,280
Do.	Do.	do.	B.	20338-41.	2,777
Do.	Do.	do.	B.	20338-41.	2,553
Do.	Do.	do.	B.	20338-41.	2,96
Do.	Do.	do.	B.	20338-41.	10,56
Do.	Do.	do.	B.	20338-41.	8,87
Do.	Do.	do.	B.	20338-41.	4,76
Do.	Do.	do.	B.	20338-41.	6,92
Do.	Do.	do.	B.	20338-41.	7,75
Do.	Do.	do.	B.	20338-41.	1,02
Do.	Do.	do.	B.	20338-41.	1,98
Do.	Do.	do.	B.	20338-41.	2,05
Do.	Do.	do.	B.	20338-41.	8,82
Do.	Do.	do.	B.	20338-41.	1,56
Do.	Do.	do.	B.	20338-41.	3,23
Do.	Do.	do.	B.	20338-41.	3,39
Do.	Do.	do.	B.	20338-41.	13,48
Do.	Do.	do.	B.	20338-41.	12,75
Do.	Do.	do.	B.	20338-41.	8,61
Do.	Do.	do.	B.	20338-41.	1,42
Do.	Do.	do.	B.	20338-41.	5,50
Do.	Do.	do.	B.	20338-41.	1,63
Do.	Do.	do.	B.	20338-41.	3,54
Do.	Do.	do.	B.	20338-41.	8,94
Do.	Do.	do.	B.	20338-41.	1,41
Do.	Do.	do.	B.	20338-41.	1,98
Do.	Do.	do.	B.	20338-41.	2,08
Do.	Do.	do.	B.	20338-41.	3,10
Do.	Do.	do.	B.	20338-41.	2,61
Do.	Do.	do.	B.	20338-41.	9,95
Do.	Do.	do.	B.	20338-41.	2,44
Do.	Do.	do.	B.	20338-41.	9,99
Do.	Do.	do.	B.	20338-41.	4,05
Do.	Do.	do.	B.	20338-41.	1,10
Do.	Do.	do.	B.	20338-41.	1,03
Do.	Do.	do.	B.	20338-41.	1,99
Do.	Do.	do.	B.	20338-41.	2,91
Do.	Do.	do.	B.	20338-41.	9,43
Do.	Do.	do.	B.	20338-41.	2,130
Do.	Do.	do.	B.	20338-41.	2,300
Do.	Do.	do.	B.	20338-41.	2,850
Do.	Do.	do.	B.	20338-41.	2,640
Do.	Do.	do.	B.	20338-41.	2,500
Do.	Do.	do.	B.	20338-41.	2,620
Do.	Do.	do.	B.	20338-41.	2,280
Do.	Do.	do.	B.	20338-41.	2,777
Do.	Do.	do.	B.	20338-41.	2,553
Do.	Do.	do.	B.	20338-41.	2,96
Do.	Do.	do.	B.	20338-41.	10,56
Do.	Do.	do.	B.	20338-41.	8,87
Do.	Do.	do.	B.	20338-41.	4,76
Do.	Do.	do.	B.	20338-41.	6,92
Do.	Do.	do.	B.	20338-41.	7,75
Do.	Do.	do.	B.	20338-41.	1,02
Do.	Do.	do.	B.	20338-41.	1,98
Do.	Do.	do.	B.	20338-41.	2,05
Do.	Do.	do.	B.	20338-41.	8,82
Do.	Do.	do.	B.	20338-41.	1,56
Do.	Do.	do.	B.	20338-41.	3,23
Do.	Do.	do.	B.	20338-41.	3,39
Do.	Do.	do.	B.	20338-41.	13,48
Do.	Do.	do.	B.	20338-41.	12,75
Do.	Do.	do.	B.	20338-41.	8,61
Do.	Do.	do.	B.	20338-41.	1,42
Do.	Do.	do.	B.	20338-41.	5,50
Do.	Do.	do.	B.	20338-41.	1,63
Do.	Do.	do.	B.	20338-41.	3,54
Do.	Do.	do.	B.	20338-41.	8,94
Do.	Do.	do.	B.	20338-41.	1,41
Do.	Do.	do.	B.	20338-41.	1,98
Do.	Do.	do.	B.	20338-41.	2,08
Do.	Do.	do.	B.	20338-41.	3,10
Do.	Do.	do.	B.	20338-41.	2,61
Do.	Do.	do.	B.	20338-41.	9,95
Do.	Do.	do.	B.	20338-41.	2,44
Do.	Do.	do.	B.	20338-41.	9,99
Do.	Do.	do.	B.	20338-41.	4,05
Do.	Do.	do.	B.	20338-41.	1,10
Do.	Do.	do.	B.	20338-41.	1,03
Do.	Do.	do.	B.	20338-41.	1,99
Do.	Do.	do.	B.	20338-41.	2,91
Do.	Do.	do.	B.	20338-41.	9,43
Do.	Do.	do.	B.	20338-41.	2,130
Do.	Do.	do.	B.	20338-41.	2,300
Do.	Do.	do.	B.	20338-41.	2,850
Do.	Do.	do.	B.	20338-41.	2,640
Do.	Do.	do.	B.	20338-41.	2,500
Do.	Do.	do.	B.	20338-41.	2,620
Do.	Do.	do.	B.	20338-41.	2,280
Do.	Do.	do.	B.	20338-41.	2,777
Do.	Do.	do.	B.	20338-41.	2,553
Do.	Do.	do.	B.	20338-41.	2,96
Do.	Do.	do.	B.	20338-41.	10,56
Do.	Do.	do.	B.	20338-41.	8,87
Do.	Do.	do.	B.	20338-41.	4,76
Do.	Do.	do.	B.	20338-41.	6,92
Do.	Do.	do.	B.	20338-41.	7,75
Do.	Do.	do.	B.	20338-41.	1,02
Do.	Do.	do.	B.	20338-41.	1,98
Do.	Do.	do.	B.	20338-41.	2,05
Do.	Do.	do.	B.	20338-41.	8,82
Do.	Do.	do.	B.	20338-41.	1,56
Do.	Do.	do.	B.	20338-41.	3,23
Do.	Do.	do.	B.	20338-41.	3,39
Do.	Do.	do.	B.	20338-41.	13,48
Do.	Do.	do.	B.	20338-41.	12,75
Do.	Do.	do.	B.	20338-41.	8,61
Do.	Do.	do.	B.	20338-41.	1,42
Do.	Do.	do.	B.	20338-41.	5,50
Do.	Do.	do.	B.	20338-41.	1,63
Do.	Do.	do.	B.	20338-41.	3,54
Do.	Do.	do.	B.	20338-41.	8,94
Do.	Do.	do.	B.	20338-41.	1,41
Do.	Do.	do.	B.	20338-41.	1,98
Do.	Do.	do.	B.	20338-41.	2,08
Do.	Do.	do.	B.	20338-41.	3,10
Do.	Do.	do.	B.	20338-41.	2,61
Do.	Do.	do.	B.	20338-41.	9,95
Do.	Do.	do.	B.	20338-41.	2,44
Do.	Do.	do.	B.	20338-41.	9,99
Do.	Do.	do.	B.	20338-41.	4,05
Do.	Do.	do.	B.	20338-41.	1,10
Do.	Do.	do.	B.	20338-41.	1,03
Do.	Do.	do.	B.	20338-41.	1,99
Do.	Do.	do.	B.	20338-41.	2,91
Do.	Do.	do.	B.	20338-41.	9,43
Do.	Do.	do.	B.	20338-41.	2,130
Do.	Do.	do.	B.	20338-41.	2,300
Do.	Do.	do.	B.	20338-41.	2,850
Do.	Do.	do.	B.	20338-41.	2,640
Do.	Do.	do.	B.	20338-41.	2,500
Do.	Do.	do.	B.	20338-41.	2,620
Do.	Do.	do.	B.	20338-41.	2,280
Do.	Do.	do.	B.	20338-41.	2,777
Do.	Do.	do.	B.	20338-41.	2,553
Do.	Do.	do.	B.	20338-41.	2,96
Do.	Do.	do.	B.	20338-41.	10,56
Do.	Do.	do.	B.	20338-41.	8,87
Do.	Do.	do.	B.	20338-41.	4,76
Do.	Do.	do.	B.	20338-41.	6,92
Do.	Do.	do.	B.	20338-41.	7,75
Do.	Do.	do.	B.	20338-41.	1,02
Do.	Do.	do.	B.	20338-41.	1,98
Do.	Do.	do.	B.	20338-41.	2,05
Do.	Do.	do.	B.	20338-41.	8,82
Do.	Do.	do.	B.	20338-41.	1,56
Do.	Do.	do.	B.	20338-41.	3,23
Do.	Do.	do.	B.	20338-41.	3,39
Do.	Do.	do.	B.	20338-41.	13,48
Do.	Do.	do.	B.	20338-41.	12,75
Do.	Do.	do.	B.	20338-41.	8,61
Do.	Do.	do.	B.	20338-41.	1,42
Do.	Do.	do.	B.	20338-41.	5,50
Do.	Do.	do.	B.	20338-41.	1,63
Do.	Do.	do.	B.	20338-41.	3,54
Do.	Do.	do.	B.	20338-41.	8,94
Do.	Do.	do.	B.	20338-41.	1,41
Do.	Do.	do.	B.	20338-41.	1,98
Do.	Do.	do.	B.	20338-41.	2,08
Do.	Do.	do.	B.	20338-41.	3,10
Do.	Do.	do.	B.	20338-41.	2,61
Do.	Do.	do.	B.	20338-41.	9,95
Do.	Do.	do.	B.	20338-41.	2,44
Do.	Do.	do.	B.	20338-41.	9,99
Do.	Do.	do.	B.	20338-41.	4,05
Do.	Do.	do.	B.	20338-41.	1,10
Do.	Do.	do.	B.	20338-41.	1,03
Do.	Do.	do.	B.	20338-41.	1,99
Do.	Do.	do.	B.	20338-41.	2,91
Do.	Do.	do.	B.	20338-41.	9,43
Do.	Do.	do.	B.	20338-41.	2,130
Do.	Do.	do.	B.	20338-41.	2,300
Do.	Do.	do.	B.	20338-41.	2,850
Do.	Do.	do.	B.	20338-41.	2,640
Do.	Do.	do.	B.	20338-41.	2,500
Do.	Do.	do.	B.	20338-41.	2,620
Do.	Do.	do.	B.	20338-41.	2,280
Do.	Do.	do.	B.	20338-41.	2,777
Do.	Do.	do.	B.	20338-41.	2,553
Do.	Do.	do.	B.	20338-41.	2,96
Do.	Do.	do.	B.	20338-41.	10,56
Do.	Do.	do.	B.	20338-41.	8,87
Do.	Do.	do.	B.	20338-41.	4,76
Do.	Do.	do.	B.	20338-41.	6,92
Do.	Do.	do.	B.	20338-41.	7,75
Do.	Do.	do.	B.	20338-41.	1,02
Do.	Do.	do.	B.	20338-41.	1,98
Do.	Do.	do.	B.	20338-41.	2,05
Do.	Do.	do.	B.	20338-41.	8,82
Do.	Do.	do.	B.	20338-41.	1,56
Do.	Do.	do.	B.	20338-41.	3,23
Do.	Do.	do.	B.	20338-41.	3,39
Do.	Do.	do.	B.	20338-41.	13,48
Do.	Do.	do.	B.	20338-41.	12,75
Do.	Do.	do.	B.	20338-41.	8,61
Do.	Do.	do.	B.	20338-41.	1,42
Do.	Do.	do.	B.	20338-41.	5,50
Do.	Do.	do.	B.	20338-41.	1,63
Do.	Do.	do.	B.	20338-41.	3,54
Do.	Do.	do.	B.	20338-41.	8,94
Do.	Do.	do.	B.	20338-41.	1,41

TABLE 1.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, per centage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
P E N N S Y L V A N I A—Contd.										
FAYETTE COUNTY.										
East Millsboro.....	Hustead.....	Pittsburgh.....	B.	23093-96.....	4	2, 110	2, 440	2, 290	8.40	1.79
HUNTINGDON COUNTY.										
Jacobs.....	Barnet.....	Lower Kittanning.....	S.B.	10319.....	1	.....	.....	+3, 010	6.38	.83
Do.....	Jacobs.....	Fulton.....	S.B.	10313-17.....	3	2, 770	+3, 010	+2, 880	8.64	1.63
Do.....	Staff.....	do.....	S.B.	10318.....	1	.....	.....	+3, 010	8.34	1.08
Robertsdale.....	Robertsdale.....	do.....	S.B.	12115-19.....	5	2, 370	+3, 010	+2, 880	6.56	1.06
Woodvale.....	Woodvale.....	do.....	S.B.	12121-23.....	3	+3, 010	+3, 010	+3, 010	5.92	.95
I N D I A N A COUNTY.										
Ernest.....	Ernest No. 2.....	Upper Freeport.....	B.	24191-92.....	2	2, 190	2, 240	2, 220	10.70	2.94
Glen Campbell.....	Electric No. 8.....	Upper Kittanning.....	B.	73812-13.....	2	2, 510	2, 630	2, 570	10.13	1.58
Do.....	Falcon No. 9.....	Lower Freeport.....	B.	73821.....	1	.....	.....	2, 360	12.76	2.81
Do.....	Falcon No. 8.....	Middle Kittanning.....	B.	73820.....	1	.....	.....	2, 830	9.52	1.83
Do.....	Hillsdale No. 6.....	Upper Freeport.....	B.	73819.....	1	.....	.....	2, 430	10.78	1.75
Do.....	Indiana No. 6.....	do.....	B.	12102-04, 06.....	4	2, 410	2, 550	2, 490	8.58	1.28
Gynsey.....	Trojan.....	Lower Freeport.....	B.	73818.....	1	.....	.....	2, 250	5.79	2.24
Homer City.....	Lucerne No. 1.....	Upper Freeport.....	B.	10306, 08-12.....	6	2, 080	2, 390	2, 290	7.12	2.12
Do.....	Lucerne No. 3.....	do.....	B.	10303-05.....	3	2, 190	2, 350	2, 240	8.28	1.98
Locust.....	Locust.....	do.....	B.	75750-51.....	2	2, 140	2, 280	2, 210	9.27	3.35
Robindale.....	Robindale.....	Lower Kittanning.....	S.B.	25135-38.....	4	2, 440	2, 490	2, 470	7.46	2.20
Scott Glen.....	Brush Valley.....	do.....	S.B.	22501-05.....	5	2, 200	2, 380	2, 260	8.09	2.99
Do.....	Brush Valley (car sample).....	do.....	S.B.	22507.....	1	.....	.....	2, 150	8.16	3.00
J E F F E R S O N COUNTY.										
Brookwayville.....	West Clarion.....	Lower Freeport.....	B.	17448.....	1	.....	.....	2, 140	10.48	2.97
Do.....	do.....	Lower Kittanning.....	B.	17450.....	1	.....	.....	2, 120	10.60	3.45
Do.....	do.....	Upper Freeport.....	B.	17449.....	1	.....	.....	2, 300	9.98	1.74

Conifer.....	Conifer.....	Brookville.....	34910-11.....	2, 130	2, 220	2, 190	10, 21	4, 59
Fuller.....	Black Prince.....	do.....	75736-37.....	2, 160	2, 180	2, 160	12, 48	5, 18
Hillman.....	Upper Freeport.....	do.....	75815-16.....	2, 400	2, 510	2, 440	8, 76	1, 91
McLarey.....	Cherokee.....	Middle Kittanning.....	34904-05.....	2, 910	2, 970	2, 940	10, 27	1, 90
Pancost.....	Panocoast.....	Upper Kittanning.....	75728-29.....	2, 240	2, 360	2, 300	2, 86	2, 86
Punxsutawney.....	Eleanora.....	Lower Freeport.....	26827-31.....	2, 120	2, 490	2, 330	7, 98	2, 04
Do.....	Williams Run No. 1.....	do.....	75754-53, 55.....	2, 140	2, 540	2, 480	5, 07	1, 22
Ramsaytown.....	No. 4.....	do.....	34916-87.....	2, 190	2, 190	2, 190	11, 49	3, 46
Sykesville.....	Sykesville.....	do.....	12455, 57-58, 71.....	2, 330	2, 720	2, 510	12, 68	2, 28
LACKAWANNA COUNTY.								
Dunmore.....	Sloan.....	Dunmore No. 2.....	11440.....	.....	.....	+3, 010	11, 94	.43
LAWRENCE COUNTY.								
Wampum.....	Country bank.....	Six-foot.....	34736-37.....	2, 130	2, 190	2, 160	5, 85	2, 62
Do.....	Crescent.....	Middle Kittanning.....	34739-41.....	2, 410	2, 540	2, 430	9, 63	3, 28
LUZERNE COUNTY.								
Pittston.....	Colliery No. 14.....	Pittston.....	11441.....	.....	.....	+3, 010	6, 03	.58
LYCOMING COUNTY.								
Ralston.....	Red Run.....	Lower Kittanning (upper bench).....	75520.....	.....	.....	2, 960	15, 31	.53
Do.....	do.....	Lower Kittanning (lower bench).....	75521.....	.....	.....	+3, 000	17, 11	.57
M'KEAN COUNTY.								
Clermont.....	Clermont.....	Lower Vein.....	34982-84.....	2, 160	2, 440	2, 270	16, 76	4, 69
Do.....	Coal Blossom.....	Upper Vein.....	34982-83.....	2, 600	2, 620	2, 610	6, 13	1, 62
MERCER COUNTY.								
Drake.....	Sharon No. 5.....	Brookville.....	34907-08.....	2, 460	2, 610	2, 540	3, 80	.95
Grove City.....	Diamond No. 3.....	do.....	34816-17.....	2, 100	2, 130	2, 270	9, 08	4, 51
Oakes Station.....	Pardoe.....	do.....	34804-05.....	2, 130	2, 220	2, 150	5, 91	1, 20
Pardoe.....	do.....	do.....	34813-14.....	2, 040	2, 260	2, 170	7, 30	3, 05
Stoneboro.....	Stoneboro No. 7.....	do.....	34810-11.....	2, 060	2, 150	2, 100	7, 27	3, 26
SOMERSET COUNTY.								
Bakersville.....	Wyand.....	Unnamed.....	17680.....	.....	.....	+3, 010	12, 65	.70
Carnbrook.....	Hitechew or Flegde.....	Brookville.....	19851.....	.....	.....	+3, 010	10, 60	1, 43
do.....	Loyal Hanna No. 6.....	do.....	19848-49.....	.....	.....	+3, 010	8, 75	.83
Confidence.....	Liamer.....	Lower Kittanning.....	13631.....	3, 010	+3, 010	.....	2, 190	2, 42
Edie.....	Levi Berkey.....	Upper Freeport.....	17691.....	.....	.....	.....	11, 22	1, 57
Elk Lick.....	Engle.....	Lower Freeport.....	13983.....	.....	.....	.....	8, 94	1, 59
Do.....	Grassy Run No. 1.....	Four-foot.....	13064.....	.....	.....	.....	13, 01	2, 36

[illegible]

TABLE 1.—Softening temperatures of coal ash from coals of the United States—(Continued).

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, per centage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
TENNESSEE— (Continued.)										
BLEDSOE COUNTY.										
Atpontley.	Atpontley No. 6.	Sewanee.	B.	22259-60.	2	2,370	2,440	2,410	8.47	1.06
Herbert.	Prospect.	do. (?)	B.	10915.	1			2,600	8.10	.58
Do.	do.	do. (?)	B.	10916.	1			2,600	6.60	.54
Lifton.	Hale.	Angel.	B.	12584.	1			2,160	5.80	1.94
Do.	New Opening.	Richland.	B.	10799.	1			2,790	9.87	.83
Do.	Prospect.	Unnamed.	B.	10803.	1			2,910	7.98	.62
Do.	Thurman.	Richland.	B.	10801.	1			2,610	7.52	.53
Pikeville.	Do.	Morgan Springs.	B.	10731.	1			2,210	10.87	3.61
Do.	McFarland.	Sewanee (?)	B.	11049.	1			2,720	8.93	.97
Do.	do.	do.	B.	11050.	1			2,540	6.89	.84
CAMPBELL COUNTY.										
Anthrax.	Anthrax.	Jellico.	B.	21853-55.	2	2,400	2,430	2,420	3.15	.85
Block.	Monarch.	do.	B.	22025-31.	4	2,060	2,470	2,320	11.29	2.77
Do.	Pee Wee.	Red Ash.	B.	22025-36.	2	2,910	2,970	2,960	5.72	1.07
Carryville.	Bear Wallow.	Coal Creek.	B.	21673-75.	3	2,530	2,610	2,570	4.39	1.94
Do.	Bear Wallow No. 2.	do.	B.	32660-62.	3	2,300	2,690	2,450	7.13	1.28
Do.	Carryville.	Red Ash.	B.	21694-96.	4	2,220	2,480	2,370	6.08	1.24
Do.	Pee Wee.	Lower Dean.	B.	21677-78.	2	2,240	2,430	2,340	3.69	1.02
Do.	Red Ash.	Red Ash.	B.	21669-71.	3	2,400	2,450	2,420	6.78	1.16
Do.	do.	do.	B.	21654-57.	4	2,400	2,590	2,510	6.24	1.18
Chaska.	Chaska.	Rich Mountain.	B.	21813.	1	2,350	2,500	2,220	1.53	.90
Coal Creek.	Cambria.	Coal Creek.	B.	21690-92.	3			2,400	3.95	.83
Cotula.	Cotula.	Jellico.	B.	32685.	1	2,380	2,380	2,380	3.07	1.41
Do.	Southern.	Jordan.	B.	21687-88.	2	2,080	2,340	2,210	3.58	1.22
Do.	Wynn.	Rich Mountain.	B.	21690-92.	3	2,440	2,460	2,450	2.10	.86
Elk Valley.	do.	Blue Gem.	B.	22016.	1			2,000	2.69	1.37
Do.	Elk Valley.	do.	B.	22018-19.	2	2,050	2,080	2,070	2.39	1.03
Do.	Perkins Branch.	do.	B.	22012-13.	2	1,950	2,130	2,040	2.04	1.04
Do.	Splint.	Splint.	B.	32641-42.	2	2,270	2,360	2,320	8.63	1.58
Do.	Old Davis Creek.	Jellico.	B.	21826.	1	2,440	2,740	2,380	6.83	1.50
Habersham.	do.	Rich Mountain.	B.	21802.04.	2			2,350	2.13	.72

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CLAIBORNE COUNTY.

Anthrac.	Tackett Creek.	Jellison.	B.	39375-77	3	2, 250	2, 620	2, 400	3, 08
Bryson	Yellow Creek No. 3.	Whitcomb.	B.	22087	1			2, 400	1, 12
Bryson	Poplar Mountain No. 1.	Poplar.	B.	22103-08	3	2, 460	2, 530	2, 400	1, 35
Bryson	Poplar Mountain No. 2.	Poplar.	B.	22105	1			2, 400	4, 95
Clairfield	Poplar Lick.	Jellison.	B.	22103	1			2, 400	7, 77
Clairfield	do.	do.	B.	21850-51	2	2, 040	2, 460	2, 250	1, 54
Clairfield	Standard.	do.	B.	21867-68	2	2, 110	2, 280	2, 150	4, 92
Eagan.	Buffalo.	do.	B.	21867-68	2	2, 110	2, 570	2, 310	3, 08
Fondre.	Clear Fork.	Mingo.	B.	21862-65	4	2, 620	2, 730	2, 600	3, 53
Fondre.	Fork Ridge No. 1.	do.	B.	22078-82	4	2, 080	2, 570	2, 380	4, 16
Fork Ridge.	Fork Ridge No. 4.	Poplar Lick.	B.	22114-17	3	2, 630	2, 950	2, 780	1, 22
Do.	Jack Rock No. 3.	Mingo.	B.	22110-12	3	2, 440	2, 680	2, 500	4, 58
Do.	Jack Rock No. 4.	Poplar Lick.	B.	33357-58	2			2, 500	8, 82
Do.	Mingo No. 4.	do.	B.	33360	1			2, 910	4, 80
Do.	Nicholson No. 2.	Mingo.	B.	33461-63	3	2, 460	2, 500	2, 350	1, 08
Do.	Mingo No. 5.	Poplar Lick.	B.	33461-68	3	2, 300	2, 400	2, 350	1, 08
Do.	Reliance No. 2.	Mingo.	B.	22067-68, 22126	3	2, 300	2, 400	2, 350	1, 47
Hartman.	do.	do.	B.	22126-27	2	2, 470	2, 500	2, 400	1, 29
Do.	do.	do.	B.	22126-27	2	2, 080	2, 400	2, 240	1, 09
Do.	do.	do.	B.	22129	1			2, 380	1, 26
Do.	Sandstone Farming.	Sandstone Farming.	B.	22119	1			10, 34	1, 36
Do.	Sandstone Farming.	Poplar Lick.	B.	22104-03	4	2, 870	+3, 010	2, 930	9, 54
Maun.	High Cliff.	Mingo.	B.	22187-90	4	2, 310	2, 600	2, 400	3, 44
Pruden.	Pruden.	do.	B.	21844-47	4	2, 060	2, 500	2, 360	1, 23
Pruden.	do.	do.	B.	32084	1			2, 330	1, 45
Conerton.	Conerton.	Jellison.	B.		1			2, 330	1, 80

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of	
						Lowest.	Highest.	Average.	Ash.	Sulphur
1										
TENNESSEE—Continued.										
CUMBERLAND COUNTY.										
Crab Orchard	Haley Mountain No. 1	Sewanee	B.	33471-72	2	2,500	2,610	2,560	7.50	0.70
Liton	Hale Prospect	Morgan Springs	B.	10802	1			2,310	11.23	3.31
Do	do	Sewanee (?)	B.	10800	1			2,850	7.81	.59
Ozone	Fox Den	Sewanee	B.	33474	1			2,570	9.35	.62
Do	Nelson	Nelson	B.	33475	1			2,640	6.77	.66
FENTRESS COUNTY.										
Davidson	Davidson	Bon Air No. 2	B.	26687-88	2	2,050	2,080	2,070	10.54	3.14
Do	Highland No. 2	do	B.	26682-84, 86	4	2,030	2,190	2,120	9.91	3.25
Gerrit	East Laurel	White Oak	B.	32780	1			2,360	6.53	1.25
Wildor	Big Laurel No. 2	Wildor	B.	33476	1			2,260	11.18	3.21
Do	Wildor No. 3	Bon Air No. 2	B.	24845-49	5	2,210	2,350	2,240	10.28	2.69
Zenith	White Oak	White Oak	B.	32798-800	3	2,460	2,550	2,500	5.60	.42
GRUNDY COUNTY.										
Coalmont	Coalmont E.	Sewanee	B.	22384	1			2,530	9.55	1.20
Do	Coalmont I.	do	B.	22383	1			2,630	12.61	.90
Do	Coalmont New A.	do	B.	22385	1			2,460	13.19	1.21
Do	Coalmont Old A.	do	B.	22386	1			2,530	10.06	1.05
Do	Coalmont S. Old Hill	do	B.	22374	1			2,580	9.40	.85
Do	Dixie No. 4	do	B.	32584	1			2,750	9.78	.62
Do	do	do	B.	22373	1			2,420	9.15	.74
Do	Mill Creek prospects	do	B.	22379, 81	2	2,210	2,690	2,450	9.54	1.84
Fremont	Tracy City No. 3	do	B.	32582	1			2,640	9.06	.65
Do	Tracy City No. 4	do	B.	32583	1			2,400	8.33	.62
Palmer	Tennessee No. 8	do	B.	32585	1			2,610	8.63	.71
Do	Tennessee No. 16	do	B.	32587	1			2,690	9.45	.60
Tracy City	East Fork	do	B.	22361	1			2,300	10.29	2.05

Do.....	East Staub.....	do.....	B.....	22963.....	1	.....	2,500	11.22	.62
Do.....	Old Clouse Hill.....	do.....	B.....	22972.....	1	.....	2,500	9.03	.86
Do.....	Do.....	do.....	B.....	22971.....	1	.....	2,300	9.18	.57
Do.....	Do.....	do.....	B.....	22984.....	1	.....	2,620	8.30	.58
Do.....	Old Ramsey.....	do.....	B.....	22990.....	1	.....	1,970	11.97	3.81
Do.....	Reed Hill No. 2.....	do.....	B.....	22405.....	1	.....	2,690	8.07	.66
Do.....	West Ramsey.....	do.....	B.....						
HAMILTON COUNTY.									
Daisy.....	Do.....	do.....	B.....	22249.....	1	.....	2,100	8.95	1.53
Montlake.....	Montlake.....	do.....	B.....	22243-45.....	3	.....	2,150	11.42	3.14
Do.....	Montlake No. 4.....	do.....	B.....	22247.....	1	1,980	2,280	11.32	1.09
Rathburn.....	Big Soddy.....	do.....	B.....	22248.....	1	.....	2,420	5.17	.77
Do.....	Furman.....	do.....	B.....	22211-12.....	2	2,570	3,010	9.33	.71
Do.....	Old Bunker.....	do.....	B.....	22190.....	1	.....	2,610	4.13	.71
Do.....	Sheephead.....	do.....	B.....	22187-88.....	2	2,720	2,960	10.48	1.43
Do.....	Soddy No. 1.....	do.....	B.....	22160, 62-63.....	3	2,180	2,260	7.79	1.28
MARION COUNTY.									
Orme.....	Battle Creek No. 3.....	Battle Creek.....	B.....	22231.....	1	.....	2,620	8.77	1.09
Do.....	Battle Creek No. 4.....	do.....	B.....	22230, 33.....	2	2,400	2,410	10.39	1.94
Tracy City.....	Long Ridge.....	Sewanee.....	B.....	22370.....	1	.....	2,580	8.95	1.19
Do.....	Pryor Ridge No. 1.....	do.....	B.....	22398-401.....	4	1,980	2,670	10.64	2.30
Whiteside.....	Castle Rock.....	do.....	B.....	22254.....	1	.....	2,300	10.31	2.41
Do.....	Clements prospect.....	do.....	B.....	22257.....	1	.....	2,210	11.24	2.95
Do.....	New Etna No. 1.....	Kelley.....	B.....	22235.....	1	.....	2,660	9.70	1.29
Do.....	Old Etna No. 2.....	do.....	B.....	22237.....	1	.....	2,400	3.56	1.36
Do.....	Old Etna No. 1.....	do.....	B.....	22251.....	1	.....	2,140	2.63	.76
Whitwell.....	Whitwell No. 1.....	Sewanee.....	B.....	22267.....	1	.....	2,560	8.53	.60
Do.....	Whitwell No. 5.....	do.....	B.....	22268-70.....	3	2,460	2,490	8.68	.93
MORGAN COUNTY.									
Blue Gem Siding.....	Bottomlee.....	Blue Gem.....	B.....	21150.....	1	.....	2,110	4.18	1.66
Do.....	Coal Cut.....	do.....	B.....	21145.....	1	.....	2,450	4.35	1.37
Catoosa.....	Catoosa No. 1.....	Unnamed.....	B.....	32743-44.....	2	2,210	2,360	8.36	3.37
Do.....	Cow Ford No. 4.....	do.....	B.....	32756.....	1	.....	2,540	7.21	1.48
Do.....	Cow Ford No. 5.....	do.....	B.....	32757.....	1	.....	2,560	5.03	1.17
Do.....	Flatrock No. 3.....	Catoosa.....	B.....	29556-58.....	3	2,340	2,260	7.11	2.59
Do.....	Panther No. 2.....	do.....	B.....	32746-47.....	2	2,270	2,380	6.45	2.51
Do.....	Red Eye.....	do.....	B.....	32758.....	1	.....	2,330	9.06	2.99
Christmas Siding.....	Grassy Ridge.....	do.....	B.....	21151.....	1	.....	2,470	3.75	1.87
Do.....	Harriman.....	Hooper.....	B.....	21152.....	1	.....	2,370	2.58	.69
Do.....	Smith.....	Hooper (?).....	B.....	21153.....	1	.....	2,590	5.54	.80
Coalfield.....	Bowling.....	Coal Creek.....	B.....	21104-05.....	2	2,080	2,170	7.97	4.14
Do.....	Conger.....	do.....	B.....	21100-02.....	3	2,150	2,190	7.97	4.13
Do.....	Davis.....	Coal Creek (?).....	B.....	21107.....	1	.....	2,130	8.28	4.13
Do.....	Slope.....	Coal Creek.....	B.....	21099.....	1	.....	2,380	4.65	1.47
Do.....	Thornton.....	Blue Gem.....	B.....	21146.....	1	.....	2,200	4.89	3.40
Do.....	Three Rock.....	Hooper.....	B.....	32998.....	1	.....	2,140	11.62	4.56
Launcing.....	Summers.....	Unnamed.....	B.....	21148.....	1	.....	2,280	2.44	.85
							2,360	4.83	1.32

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.				Average analysis of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.	
1						3	4	5	6	7	
TENNESSEE— (continued.)											
MORGAN COUNTY continued.											
Nemo.	Lower Seam.	do.	B.	32760.	1	.....	.....	3,600	15.64	0.85	
Do.	Upper Seam.	do.	B.	32759.	1	.....	.....	2,540	9.92	1.80	
Do.	Calocsa.	do.	B.	21428.	1	.....	.....	2,430	7.49	1.33	
Oakdale.	Babatchah.	Walden Ridge.	B.	32755.	1	.....	.....	2,620	15.50	1.85	
Oliver Springs.	Big Mountain.	Unamed.	B.	21424.	1	.....	.....	2,040	6.75	4.24	
Do.	Jackson.	Coal Creek.	B.	21426.	1	.....	.....	2,270	3.77	1.01	
Do.	Levan.	Coal Creek (?)	B.	21420.	1	.....	.....	2,290	3.37	1.39	
Do.	New Eagle No. 1.	Old Eagle.	B.	32699.	1	.....	.....	2,380	6.20	3.54	
Do.	Old Mount Carbon.	Poplar Creek.	B.	21421.	1	.....	.....	2,200	3.29	1.21	
Do.	Poplar Creek.	Coal Creek.	B.	21423.	1	.....	.....	2,040	7.16	3.97	
Do.	Prudential.	do.	B.	21472-74.	3	1,990	2,010	2,000	9.51	4.61	
Do.	Reed.	Unamed.	B.	21425.	1	.....	.....	2,300	4.25	.72	
Do.	Richards.	Coal Creek.	B.	21116-17.	2	2,050	2,060	2,060	9.03	5.50	
Do.	Signal Mountain.	do.	B.	21422.	1	.....	.....	2,080	5.31	1.79	
Do.	Unamed.	Poplar Creek.	B.	32702.	1	.....	.....	2,230	5.24	1.13	
Do.	Williams.	Coal Creek.	B.	21419.	1	.....	.....	2,480	5.41	1.13	
Petros.	Big Brushy.	Jellico.	B.	32993-95.	3	2,520	2,520	2,520	9.51	3.75	
Do.	Frozen Head.	do.	B.	21083.	1	.....	.....	2,580	.92	.92	
Do.	Petros No. 5.	Frozen Head.	B.	21088-90.	3	2,330	2,430	2,370	7.36	2.55	
Do.	State No. 3.	Jellico.	B.	21092-95.	4	2,130	2,430	2,300	8.30	2.72	
Do.	Unamed.	do.	B.	21149.	1	.....	.....	2,070	7.20	2.80	
Stephens.	Lynmace.	Unamed.	B.	21084-86.	3	2,130	2,350	2,210	5.14	2.08	
Do.	Little Brushy.	Jellico.	B.	.....	.....	.....	.....	.....	.....	.....	
OVERTON COUNTY.											
Davidson.	Briar Hill No. 1.	Wildor.	B.	33468-69.	2	2,270	2,390	2,330	8.78	2.54	
Do.	Briar Hill No. 2.	do.	B.	33465-66.	2	2,270	2,270	2,270	9.19	2.70	
Do.	Buckeye.	do.	B.	33441-43.	3	2,210	2,370	2,270	10.01	3.09	
Do.	Good.	do.	B.	33445-47.	3	2,220	2,310	2,260	11.20	3.00	
Do.	Tunnel.	do.	B.	33437-39.	3	2,300	2,330	2,310	9.81	2.63	

Highland Junction.	Overton.....	Bon Air No. 2.	B.	20978-80.	3	2,120	2,190	10.57	3.15
Lovejoy.	Bill's Branch.	Wilder.	B.	33454-55.	2	2,010	2,040	13.89	6.63
Obey City.	Bon Air No. 2.	Bon Air No. 2.	B.	20991	1	.....	2,060	13.89	3.90
Do.	Peacock.	do.	B.	20992	1	.....	2,160	10.29	3.40
Wilder.	Wilder No. 3.	Wilder.	B.	33449-52.	4	2,060	2,230	10.52	3.50
FUTNAM COUNTY.									
Monterey.	Monterey	Bon Air No. 2.	B.	20990	1	.....	2,100	10.07	3.55
RHEA COUNTY.									
Dayton.	New Prospect.	Nelson.	B.	10696-99.	4	2,460	2,690	18.46	.49
Do.	North Pole.	Richland.	B.	10689-90.	4	2,250	2,480	14.21	1.40
Graysville.	Montague No. 1.	Nelson.	B.	22159-63.	2	2,010	2,290	11.79	2.24
Do.	Montague No. 3.	Sewanee.	B.	22180-83.	4	2,070	2,710	12.35	1.28
Do.	Montague No. 6.	Nelson.	B.	22158.	1	.....	2,280	25.93	.59
ROANE COUNTY.									
De Armond.	Wilcox.	Rockwood.	B.	32754	1	.....	2,140	8.55	.67
Emory Gap.	Emory Gap.	do.	B.	32752	1	.....	2,090	8.83	.55
Hartman.	Blizzard.	do.	B.	32753.	1	.....	2,440	6.80	.51
Do.	Walden Ridge.	Walden Ridge.	B.	21082.	1	.....	2,730	8.85	.50
McLean.	McLean.	Sewanee.	B.	21024	1	.....	2,090	9.81	.81
Rockwood.	Rockwood.	do.	B.	18095-97, 21016-18.	6	2,250	2,480	9.50	.54
SCOTT COUNTY.									
Bear Creek Junction.	Phillips.	No. 4.	B.	21154-55.	2	2,190	2,590	6.84	2.02
Do.	Wilson.	do.	B.	21218-20.	3	2,630	2,660	11.32	5.22
Helenwood.	Flat Creek.	Glen Mary.	B.	32750.	2	2,200	2,330	8.45	3.54
Do.	Helenwood.	do.	B.	32746-41.	2	.....	.....	8.61	4.65
Wagon.	do.	do.	B.	32749.	1	.....	2,300	13.61	4.10
Huntsville.	Cross.	Paint Rock.	B.	21222.	1	.....	2,050	9.03	3.78
Jake's Tank.	do.	do.	B.	21226.	1	.....	2,680	4.83	8.32
Do.	Opessum Jaw.	do.	B.	21223.	1	.....	2,050	8.33	3.47
Newland.	Arch Mountain.	Jellico.	B.	21272.	1	.....	2,630	5.57	1.93
Do.	Southern No. 2.	Big Mary.	B.	32765-66.	2	2,460	2,520	9.35	2.73
Do.	Pemberton No. 1.	Jellico.	B.	32788.	1	.....	2,100	7.65	1.76
Robbins.	Clay No. 1.	Blue Gem (?)	B.	21228.	1	.....	1,960	9.49	3.85
Do.	Hughett.	Mud Slip.	B.	21228.	1	.....	2,610	4.21	3.92
Do.	do.	Blue Gem (?)	B.	21314.	1	.....	2,580	4.21	1.08
Do.	Long prospect.	Unnamed.	B.	21316.	1	.....	2,210	4.26	1.25
Do.	Newman prospect.	do.	B.	21315.	1	.....	2,500	5.71	1.08
Do.	Southern No. 5.	Glen Mary.	B.	32751.	1	.....	2,560	10.41	5.35
Stanley Junction.	Keaton.	Paint Rock.	B.	32791.	1	.....	2,580	4.43	.80
Do.	Morning Glory.	do.	B.	32791.	1	.....	2,320	4.58	.78
Do.	Paint Rock.	do.	B.	32790.	1	.....	2,360	3.44	.73
Do.	Pumpkin Hollow.	do.	B.	21225.	1	.....	2,600	5.08	.65
Do.	Sexton.	do.	B.	21224, 32792-93.	3	2,330	2,420	4.18	.84
Do.	Terry No. 5.	do.	B.	32787.	1	.....	2,610	6.54	.72

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature, ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
TENNESSEE—Continued.										
SEQUATCHIE COUNTY.										
Dunlap.....	Douglas No. 2.....	Sewanee.....	B.	22239-41.....	3	2, 330	2, 460	2, 380	10.12	1.35
WHITE COUNTY.										
Bon Air.....	Bon Air.....	Bon Air (lower bench).....	B.	22365-68.....	4	2, 300	2, 420	2, 350	7.87	2.87
Clifty.....	Clifty No. 1.....	Sewanee (?).....	B.	12623-26, 22388-91.....	8	1, 990	2, 060	2, 040	13.15	4.24
Ravenscroft.....	Ravenscroft.....	Bon Air (?).....	B.	22393-96.....	4	2, 050	2, 210	2, 140	10.78	4.19
TEXAS.										
WEBB COUNTY.										
Dolores.....	Dolores.....	San Pedro.....	L.	29022.....	1	.....	.....	2, 330	12.75	2.04
Do.....	do.....	Santo Tomas.....	L.	29021.....	1	.....	.....	2, 590	19.89	2.17
Santo Tomas.....	Santo Tomas.....	do.....	L.	29024.....	1	.....	.....	2, 570	18.52	1.78
UTAH.										
CARBON COUNTY.										
Carbon.....	Panther.....	Castlegate.....	B.	19881.....	1	.....	.....	2, 110	5.59	.60
Castlegate.....	Cameron No. 1.....	"No. 1".....	B.	19880.....	1	.....	.....	2, 230	6.40	.41
Do.....	Cameron No. 2.....	"No. 2".....	B.	19879.....	1	.....	.....	2, 170	6.78	.48
Do.....	Castlegate No. 1.....	"A".....	B.	19847.....	1	.....	.....	2, 100	6.46	.51
Do.....	do.....	"C".....	B.	19846.....	1	.....	.....	2, 080	5.02	.49
Do.....	do.....	"D".....	B.	19844.....	1	.....	.....	2, 130	7.37	.63
Do.....	Castlegate No. 2.....	"B".....	B.	19845.....	1	.....	.....	2, 210	9.44	.68
Do.....	do.....	"D".....	B.	19843.....	1	.....	.....	2, 150	5.51	.34
Helper.....	Prospect.....	Spring Canyon No. 1.....	B.	19837.....	1	.....	.....	2, 360	7.85	.80
Do.....	do.....	do.....	B.	19838.....	1	.....	.....	2, 260	9.09	.72
Hiawatha.....	Hiawatha No. 1.....	Hiawatha.....	B.	10904-05.....	2	2, 140	2, 430	2, 280	6.16	.74
Do.....	Hiawatha No. 2.....	do.....	B.	10907-08.....	2	2, 220	2, 220	2, 220	7.50	.55

	Book	Cliffs (?)	B.	10044, 46	2	2, 150	2, 156	2, 157	4, 64	35
Kenilworth.....	Aberdeen.....	Kenilworth.....	B.	19702.....	1			2, 130	6, 68	43
Do.....	do.....	do.....	B.	19680, 711.....	2	2, 120	2, 150	2, 140	5, 65	46
Do.....	do.....	do.....	B.	19681, 712.....	2	2, 130	2, 150	2, 140	5, 52	50
Do.....	do.....	do.....	B.	19682, 710.....	2	2, 150	2, 160	2, 160	4, 40	70
Do.....	do.....	do.....	B.	19705.....	1			2, 130	5, 56	56
Do.....	do.....	do.....	B.	10045.....	1			2, 130	4, 57	65
Do.....	do.....	do.....	B.	14678.....	1			2, 220	3, 06	61
Do.....	do.....	do.....	B.	19688-89.....	2	2, 150	2, 150	2, 130	6, 26	40
Do.....	do.....	do.....	B.	19689.....	1			2, 130	8, 82	58
Do.....	do.....	do.....	B.	19687.....	1			2, 110	3, 25	40
Do.....	do.....	do.....	B.	19690.....	1			2, 190	8, 57	41
Do.....	do.....	do.....	B.	14801.....	1			2, 210	4, 20	52
Do.....	do.....	do.....	B.	12792.....	1			2, 620	3, 58	1, 11
Do.....	do.....	do.....	B.	12652.....	1			2, 390	7, 01	1, 84
Do.....	do.....	do.....	B.	12631, 17604.....	2	2, 550	2, 980	2, 760	8, 04	1, 32
Do.....	do.....	do.....	B.	12546, 630, 17605.....	3	2, 620	+ 3, 010	+ 2, 880	7, 69	67
EMERY COUNTY.										
Black Hawk.....	Black Hawk.....	Hiawatha.....	B.	22550-53, 55, 414.....	6	2, 040	2, 430	2, 130	6, 34	78
Emery.....	Browning.....	"C".....	B.	12627.....	1			2, 100	6, 17	41
Do.....	Casper.....	"D".....	B.	12652.....	1			2, 430	14, 90	85
Do.....	Surface prospect.....	"E".....	B.	14963.....	1			2, 100	8, 52	1, 34
Do.....	Williams.....	"F".....	B.	12615.....	1			2, 000	12, 10	4, 85
GRAND COUNTY.										
Thompson.....	No. 1-A.....	"B".....	B.	17577.....	1			2, 960	11, 24	71
Do.....	Prospect.....	"A".....	B.	17578.....	1			2, 670	11, 28	65
MORGAN COUNTY.										
Devil's Slide.....	Heber Robinson.....	Unnamed.....	Sb. B.	19799.....	1			2, 500	23, 47	77
Do.....	Lucas & Smith.....	do.....	Sb. B.	19800.....	1			2, 560	21, 39	56
SANPETE COUNTY.										
Wales.....	Coal Creek.....	Unnamed.....	B.	17715.....	1			2, 040	23, 36	7, 05
Do.....	North Tunnel.....	do.....	B.	17717.....	1			2, 210	19, 66	3, 80
Do.....	Thomas.....	do.....	B.	17718.....	1			2, 130	16, 17	4, 76
SEVIER COUNTY.										
Emery.....	Surface prospect.....	"A".....	B.	15061.....	1			2, 470	6, 83	50
Fremont.....	Hogan prospect.....	"A".....	B.	15060.....	1			2, 390	13, 83	3, 77
Salina.....	Kearns & Duggins.....	"Duggins".....	B.	15045.....	1			2, 320	13, 07	47
SUMMIT COUNTY.										
Carter.....	Prospect.....	Unnamed.....	B.	20825.....	1			2, 710	15, 86	57
Do.....	do.....	do.....	B.	20804.....	1			2, 150	10, 55	5, 28
Coalville.....	Ross-Crass Creek.....	Wasatch.....	Sb. B.	13216.....	1			2, 420	3, 96	2, 16
Do.....	Superior.....	do.....	Sb. B.	13217.....	1			2, 130	1, 85	1, 57
Do.....	Wasatch.....	do.....	Sb. B.	13218.....	1			2, 350	4, 72	1, 59

TABLE 1.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
UTAH—Contd.										
UINTA COUNTY.										
Vernal.....	Blue Bell.....	Unnamed.....	B.	10712.....	1				10.56	1.65
Do.....	Green.....	do.....	B.	10713.....	1				9.03	2.59
Do.....	Reynolds.....	Maneros.....	B.	10812.....	1				7.56	1.07
WASATCH COUNTY.										
Hanna.....	Prospect.....	Unnamed.....	Sh. B.	10998.....	1				6.95	.93
Do.....	Winchester prospect.....	Maneros.....	L.	10997.....	1				3.57	.83
Heber.....	Cummings.....	Unnamed.....	Sh. B.	11058.....	1				7.68	.85
VIRGINIA.										
BUCHANAN COUNTY.										
Big Rock.....	Oliver Elswick.....	Unnamed.....	B.	19735.....	1			+3,010	7.23	.69
Blackey.....	Blackey.....	Mohawk.....	B.	19833-34.....	2	2,060	2,260	2,160	3.49	1.32
Whitewood.....	Whitewood.....	Unnamed.....	S. B.	19924.....	1			+3,010	13.74	.73
DICKENSON COUNTY.										
Clintwood.....	Yeates.....	Clintwood.....	B.	14766.....	1			2,670	3.26	.87
Mart.....	Owen's.....	Splash Dam.....	B.	17751-52.....	2	2,690	2,750	2,720	5.77	.65
Nora.....	Nora Mills.....	Widow Kennedy.....	B.	17559-60.....	2	2,130	2,260	2,200	9.79	.74
Prater.....	Yellow Poplar.....	Upper Banner.....	B.	17743-44.....	2	2,430	2,630	2,530	7.02	1.08
HENRICO COUNTY.										
Gayton.....	Carbon Hill.....	B.....	S. B.	15051.....	1			2,420	17.73	2.21
Do.....	do.....	C.....	S. B.	15050.....	1			2,160	9.28	1.47
Do.....	do.....	C.....	N. C.	15052.....	1			2,250	11.23	1.34

LEE COUNTY.

Keokee.....	Mohawk No. 1.....	Kelly (?).....	B.	75748.	2,630	6.81	.80
Do.....	Mohawk No. 2.....	do.....	B.	75747.	2,680	6.76	.91
Do.....	Stonega No. 1.....	McConnell.....	B.	75678-79.	2,570	4.62	.75
Do.....	Stonega No. 3.....	Wilson.....	B.	75675-76.	2,110	5.18	2.38
Pennington Gap.....	Emerald No. 1.....	No. 3 (Wilson).....	B.	75787.	2,190	10.28	3.86
Do.....	Stone Creek No. 1.....	Stone Creek.....	B.	75905.	2,190	4.78	1.98
Do.....	Virginia Blue Gem No. 1.....	North Fork.....	B.	75907.	2,800	2.29	1.75
Do.....	Penn Lee No. 1.....	No. 1.....	B.	34978.	2,900	5.74	.79
Do.....	Penn Lee No. 4.....	do.....	B.	34979.	2,710	3.99	.72
Do.....	Puckett No. 1.....	No. 3 (Wilson).....	B.	75788.	2,330	8.87	2.04
Pockett.....	Reed Creek.....	Unnamed.....	B.	29684-85.	2,250	8.87	2.04
St. Charles.....	Benedict No. 1.....	No. 7.....	S. B.	75789-90.	2,660	9.44	3.69
Do.....	Black Diamond No. 1.....	Jack Rock No. 3.....	B.	34981.	2,950	8.46	.78
Do.....	Freelheart No. 1.....	2A.....	B.	75908.	2,470	14.22	2.77
Do.....	Old Virginia No. 3.....	No. 5.....	B.	75792-93.	2,110	11.83	.63
Do.....	St. Charles No. 1.....	2A.....	B.	75906.	2,110	2.74	.71
Do.....	Tomlinson-Pearly No. 1.....	No. 2.....	B.	75909.	2,100	10.28	.64
Do.....	Virginia Lee No. 1.....	No. 5.....	B.	34980.	2,100	5.88	2.12
Do.....	Virginia Iron No. 2.....	No. 6 (low splint).....	B.	75807.	2,640	3.43	.55
Do.....	Virginia Iron No. 3.....	do.....	B.	75806.	2,630	9.70	1.05

MONTGOMERY COUNTY.

Blacksburg.....	Clements Hollow.....	Small.....	S. B.	19359.	+ 3,010	42.98	.34
Do.....	Plunkett & Wall.....	Large.....	S. B.	19357.	+ 3,010	18.06	.52
Do.....	Seymour-Price.....	do.....	S. B.	19360.	2,960	19.34	.59
Do.....	Slusser.....	do.....	S. B.	19358, 22629-30.	2,410	17.55	.60
Do.....	do.....	do.....	S. B.	30689.	2,260	15.04	.56
Christiansburg.....	Lyken Hill.....	do.....	S. A.	19403.	+ 3,010	22.70	.72
Merrimac Mines.....	Merrimac.....	"Big".....	S. A.	30692.	2,650	20.07	.48
Do.....	Merrimac prospect.....	"Little".....	S. A.	30693.	+ 3,010	21.29	.49

FULASKI COUNTY.

Dublin.....	Cloyd.....	"Upper".....	S. B.	20722.	3,010	24.23	.42
Guntton Park.....	Summit.....	do.....	S. B.	30696.	3,010	25.59	.78
Parrott.....	Parrott.....	"Big".....	S. B.	30694.	2,350	23.97	.68
Do.....	do.....	do.....	S. B.	19431.	3,010	23.28	.69

RUSSELL COUNTY.

Dante.....	Clinchfield.....	Lower Banner.....	B.	10385.	2,350	6.59	.66
Do.....	Clinchfield No. 2.....	Upper Banner.....	B.	10375, 18128-30, 32168-71.	2,210	6.88	.63
Do.....	Clinchfield No. 3.....	do.....	B.	10387, 32326-27.	2,350	7.88	.63
Do.....	Clinchfield No. 52.....	Lower Banner.....	B.	18122-23, 32329-30.	2,180	6.61	.69
Do.....	Clinchfield No. 103.....	Kennedy.....	B.	18121.	2,220	7.64	1.83
Do.....	Laurel Branch.....	do.....	B.	32452-53.	2,400	25.12	2.02
Do.....	Open exposure.....	Kelly.....	B.	32454.	2,290	4.52	.93

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.				Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.	
1											
VIRGINIA—Contd.											
RUSSELL COUNTY—continued.											
Della.....	Flat Rock.....	Kennedy.....	B.	25367-68.....	2	2,090	2,160	2,130	9.58	0.84	
Do.....	Jackson.....	Unnamed.....	B.	22346.....	1	.....	.....	2,070	12.96	.96	
Drill.....	Do.....	Kennedy.....	B.	19484.....	2	.....	.....	2,230	6.94	1.03	
Do.....	Sandy Ridge.....	Do.....	B.	19428, 22345.....	1	2,070	2,220	2,150	5.81	1.00	
St. Paul.....	Do.....	Do.....	B.	32513.....	1	.....	.....	2,130	3.96	.49	
Stemp.....	Russell Fork.....	Unnamed.....	B.	18239-41.....	3	2,160	2,200	2,180	6.58	.49	
Wilder.....	Clinchfield No. 201.....	No. 4.....	B.	No. 4.....	3	2,260	2,360	2,300	5.86	.57	
Do.....	Clinchfield No. 6.....	Upper Banner.....	B.	18235-37.....	3	2,200	2,450	2,320	5.92	.82	
Do.....	Clinchfield No. 55.....	Lower Banner.....	B.	18243-45.....	3	.....	.....	.....	.....	.....	
SCOTT COUNTY.											
Adamar.....	Hagan.....	Unnamed.....	B.	10359.....	1	.....	.....	2,530	29.61	1.01	
Dungannon.....	J. S. T. do.....	do.....	B.	75743-44.....	2	2,740	2,780	2,760	7.12	.91	
Ka.....	Milner prospect.....	Milner.....	B.	10358.....	1	.....	.....	2,120	5.89	1.69	
Do.....	Hagan prospect.....	Duncan.....	B.	10361.....	1	.....	.....	2,160	6.65	.88	
TAEWELL COUNTY.											
Bandy.....	Christian.....	Middle Seaboard.....	B.	25913.....	1	.....	.....	2,360	4.15	1.03	
Do.....	Patrick.....	Lower Seaboard.....	B.	25912.....	1	.....	.....	2,260	3.67	1.14	
Boissevain.....	Big Vein No. 2.....	Pocahontas No. 3.....	S. B.	67927, 67964.....	2	2,410	2,500	2,460	4.40	.60	
Do.....	Boissevain.....	do.....	S. B.	901, 63-04, 67922-23, 25, 57, 60, 71.....	13	2,030	2,560	2,270	4.05	.51	
Faraday.....	Altizer.....	Pocahontas No. 5.....	S. B.	26101.....	1	.....	.....	2,090	5.19	.82	
Jewell.....	Jewell Ridge No. 1.....	Raven (Red Ash).....	S. B.	25651-52.....	2	2,500	2,640	2,570	5.94	.78	
Pocahontas.....	Baby.....	Pocahontas No. 3.....	S. B.	67921, 24, 26.....	3	2,490	2,580	2,530	4.33	.53	
Do.....	Big Vein No. 1.....	do.....	S. B.	67886, 89, 902, 934, 951.....	5	2,380	2,640	2,520	3.98	.62	
Do.....	West Pocahontas.....	do.....	S. B.	67910, 53-54, 58.....	4	2,190	2,500	2,320	4.52	.46	

TABLE I.—Softening temperatures of coal ash from coals of the United States—(Continued).

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, per-centage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
		1			2	3	4	5	6	7
WASHINGTON.										
CLALLAM COUNTY.										
Clallam.....	Fuca.....	Unnamed.....	B.	10030.....	1			1, 870	14.16	5.75
KING COUNTY.										
Cumberland.....	Rose-Marshall.....	Unnamed.....	B.	10512.....	1			2, 960	17.24	.63
Durham.....	Prospect.....	No. 1.....	B.	32964.....	1			3, 000	17.51	.54
Do.....	do.....	No. 2.....	B.	32965.....	1			2, 730	21.42	.58
Grand Ridge.....	do.....	No. 3.....	Sb. B.	11736.....	1			2, 610	11.38	.58
Do.....	do.....	No. 4.....	Sb. B.	11737.....	1			2, 400	24.44	2.69
Do.....	do.....	No. 7.....	Sb. B.	11738.....	1			2, 640	15.01	.45
Ravensdale.....	Ravensdale No. 1.....	No. 3.....	B.	23495.....	1			2, 380	6.91	.37
Snoqualmie.....	Niblock.....	do.....	B.	10031.....	1			2, 950	11.65	.51
Do.....	do.....	No. 4.....	B.	10032.....	1			2, 930	13.21	.94
Do.....	do.....	No. 5.....	B.	10033.....	1			2, 910	25.58	1.56
KITTITAS COUNTY.										
Ellensburg.....	Prospect.....	No. 7.....	B.	13266.....	1			2, 760	25.47	1.26
Do.....	do.....	No. 9C.....	B.	13268.....	1			2, 250	7.73	.69
Do.....	do.....	No. 10D.....	B.	13267.....	1			2, 380	23.83	1.20
Do.....	do.....	Unnamed.....	B.	26223.....	1			2, 580	17.73	1.59
Roslyn.....	Roslyn No. 1.....	Roslyn.....	B.	11522-24.....	3	2, 350	2, 590	2, 440	12.99	.40
Do.....	Roslyn No. 2.....	do.....	B.	11526.....	1			2, 320	11.94	.49
Thorp.....	Wilson (run-of-mine).....	Unnamed.....	B.	13269.....	1			2, 250	17.52	.47
LEWIS COUNTY.										
Centralla.....	Fords Prairie.....	Unnamed.....	Sb. B.	29564.....	1			2, 200	11.14	.87
Do.....	Monarch.....	do.....	Sb. B.	29570.....	1			1, 990	12.16	1.37

Chehalis	do.	9944	2,340	2,380	2,290	10.83	2.50
Do.	do.	9943, 29569			2,360	8.30	.75
Sheldon	Superior No. 2	28568			2,150	12.18	1.08
Do.	Unamed	9942			2,340	14.99	.45
Do.	do.	9941			2,170	7.12	1.80
Do.	do.	9945			2,270	14.04	.39
Ladd	East Creek Ladd	9982			2,240	18.05	1.31
Do.	do.	9980 81	2,570	2,670	2,620	22.54	.73
Do.	No. 3	B.			2,910	26.78	.93
Do.	No. 4	B.			2,710	28.73	1.17
Do.	No. 5	B.			2,530	30.34	.73
Do.	Prospect	33072			2,150	12.79	4.35
Do.	do.	9940			2,290	15.97	1.51
Littell	Crescent	10323-24, 29565	2,230	2,350	2,760	25.06	.84
Mendota	Mendota	12563			2,970	17.40	.73
Morton	Prospect	12564			2,660	25.48	.90
Do.	Unamed	12565					
Do.	do.						
PIERCE COUNTY.							
Ashford	Mashel	9984-85	2,710	2,860	2,780	33.77	.59
Do.	Prospect	12581			2,650	25.72	.44
Burnett	do.	9981			2,320	8.44	.79
Do.	No. 3	B.	2,350	2,420	2,380	13.74	.39
Carbonado	do.	9989-90			2,720	15.40	.47
Do.	No. 1	B.			2,210	18.86	3.31
Do.	No. 1 Coking	9569			2,640	15.98	.41
Do.	No. 2 Coking	9557			2,740	17.54	.36
Do.	No. 3 Coking	9555, 85	2,640	2,840	2,350	10.77	.33
Do.	No. 4	B.			2,890	16.99	.58
Do.	do.	9564			2,840	16.10	.54
Do.	No. 5	B.			2,740	20.42	.41
Do.	No. 9	B.			2,190	9.66	.52
Do.	No. 11	B.	2,180	2,190	2,200	6.68	.84
Do.	Wingate	9569, 9601			2,670	15.04	.34
Do.	do.	9558			2,240	13.16	.70
Carbon Hill No. 6	Wilkeson	10573-74	2,610	2,730	2,740	10.51	.54
Carbonado No. 4N	Blacksmith	9609			2,910	34.22	.48
Fairfax	do.	9607			2,570	13.50	1.03
Do.	No. 3	B.			2,890	25.44	.73
Do.	No. 7	B.			2,430	20.21	.51
Do.	No. 8	B.			2,970	11.07	.57
Do.	Montezuma	9602			2,800	35.15	.57
Do.	do.	9603			2,370	8.46	1.19
Do.	do.	9605			2,900	20.36	.70
Do.	do.	9606			2,880	19.49	.73
Do.	No. 4	B.			2,800	18.28	.43
Do.	Prospect	12478			2,880	13.70	.34
Do.	Prospect No. 1	12496			2,880	24.19	.57
Do.	Prospect No. 2	12495			2,760	19.79	.44
Melmont	Melmont	9577	2,850	2,910	2,800	21.38	.58
Do.	do.	9576, 80	2,410	2,750	2,300	21.87	.42
Do.	do.	9578-79			2,880	18.28	.43
Do.	Black Carbon	B.			2,880	13.70	.34
Pittsburg	Lady Wellington	9982			2,760	24.19	.57
Do.	Pittsburg	9985			2,300	21.38	.58
Do.	do.	9984			2,360	25.48	.90
South Willis	Pittsburg	9906			2,300	21.87	.42
Do.	South Willis				2,360	25.48	.90

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
2										
3										
4										
5										
6										
7										
WASHINGTON—Continued.										
PIERCE COUNTY—continued.										
Wilkeson.....	Briar Hill.....	Unnamed.....	B.	9887.....	1	.....	.....	2,700	23.91	1.21
Do.....	Gale Creek.....	No. 1.....	B.	9908.....	1	.....	.....	2,300	8.53	.85
Do.....	do.....	No. 2.....	B.	9909.....	1	.....	.....	2,390	6.22	1.00
Do.....	do.....	Queen.....	B.	9910.....	1	.....	.....	2,220	9.83	1.04
Do.....	do.....	Snell.....	B.	9896.....	1	.....	.....	2,800	18.72	.84
Do.....	Wilkeson.....	No. 2.....	B.	9903-05.....	3	2,720	2,850	2,780	17.99	.47
Do.....	do.....	No. 3.....	B.	9900-02.....	3	2,240	2,970	2,570	14.27	.47
Do.....	do.....	No. 7.....	B.	9899.....	1	.....	.....	2,380	10.38	.44
STEVENS COUNTY.										
Valley.....	Valley.....	Unnamed.....	Sb. B.	34156-57.....	2	2,040	2,070	2,060	22.73	2.82
THURSTON COUNTY.										
Hurn.....	Hannaford No. 1.....	Unnamed.....	Sb. B.	9573.....	1	.....	.....	2,150	7.69	.55
Do.....	Black Bear.....	do.....	Sb. B.	9839.....	1	.....	.....	2,570	27.61	1.79
Do.....	Klug.....	do.....	Sb. B.	9987.....	1	.....	.....	2,210	14.12	3.09
Tono.....	Hannaford.....	do.....	Sb. B.	29566-67.....	2	2,330	2,340	2,340	12.28	1.19
WHATCOM COUNTY.										
Bellingham.....	Bellingham.....	No. 1.....	B.	32034.....	1	.....	.....	2,450	18.01	.28
Glacier.....	Discovery tunnel.....	Unnamed.....	A.	19722-23.....	2	2,430	2,510	2,470	11.65	1.04
Do.....	Prospect.....	do.....	S. A.	19726.....	1	.....	.....	2,440	8.35	1.05
Do.....	do.....	do.....	S. A.	19725.....	1	.....	.....	2,590	9.95	1.11
Do.....	Smith tunnel.....	do.....	A.	19724.....	1	.....	.....	3,000	9.56	.97

WEST VIRGINIA.		Braxton.....		Pittsburgh.....		B.		13556.....		1		2,090		8.93		3.50	
BRAXTON COUNTY.		Braxton.....		Pittsburgh.....		B.		13556.....		1		2,090		8.93		3.50	
BROOKE COUNTY.		Lewis-Finley No. 1.....		Pittsburgh.....		B.		15671-72.....		2		2,340		6.28		1.75	
		Do.....		do.....		B.		15671-72.....		5		2,030		8.54		2.65	
		Short Creek.....		do.....		B.		31597-401.....		5		2,210		8.15		1.70	
CLAY COUNTY.		Rich Run.....		No. 5 or Block.....		B.		21816-17, 92, 23587-93.....		10		+2,750		7.14		.94	
FAYETTE COUNTY.		Beards Fork (run-of-mine, 18 cars).....		No. 2 Gas.....		B.		76503.....		1		2,740		7.32		.83	
		Do.....		do.....		B.		77195-98.....		4		2,680		5.08		1.11	
		Boomer North No. 2.....		Eagle (No. 1).....		B.		23487-88.....		2		+2,400		4.39		.75	
		Caperton.....		Sewell.....		B.		14345-46, 48-49.....		4		+2,840		2.44		.56	
		Berryvale.....		do.....		S. B.		78808.....		1		2,340		5.03		.86	
		Dunlop.....		do.....		S. B.		78806.....		1		2,300		4.72		1.16	
		Do.....		do.....		S.		14383, 85, 87, 88.....		4		2,620		2.64		.55	
		Elverton.....		do.....		B.		14384-86, 41-42.....		4		2,300		2.44		.55	
		Glen Jean.....		do.....		B.		77177-78.....		2		2,190		4.07		1.87	
		Do.....		do.....		B.		76391.....		2		2,040		6.21		2.45	
		Do.....		do.....		B.		77205.....		1		2,770		3.22		.68	
		Do.....		do.....		B.		76880.....		1		2,500		5.22		.76	
		Do.....		do.....		S. B.		76840, 64.....		4		2,550		5.30		.78	
		Ingman Branch No. 2.....		Big Eagle.....		B.		77293-96.....		4		2,650		4.03		1.08	
		Do.....		do.....		B.		76394.....		1		2,780		8.96		.99	
HAWK'S NEST.		Mill Creek No. 1.....		Sewell.....		B.		14358-61.....		4		2,510		4.01		.63	
		Kay Moor No. 1.....		do.....		B.		14294-97, 99.....		5		2,490		3.17		.56	
		Do.....		do.....		B.		14401-03.....		3		2,530		3.57		.84	
		Do.....		do.....		B.		77193.....		1		2,440		5.06		.97	
		Kilgus No. 1, 2, 3, 4.....		Fire Creek.....		B.		68180, 86, 96, 224-225.....		5		+2,630		5.1		.66	
		Layland.....		do.....		B.		21402-06.....		5		2,670		5.08		.77	
		Lick Fork Nos. 1 and 2, (run-of-mine, 14 cars).....		No. 2 Gas and Big Eagle.....		D.		77486.....		1		2,740		7.90		1.20	
		Do.....		No. 2 Gas.....		B.		77486-11.....		2		2,620		6.84		1.18	
		Do.....		Big Eagle.....		B.		77213.....		1		2,730		4.45		.81	
		Lochelly.....		Sewell.....		B.		77240.....		1		2,680		4.95		.86	
		Do.....		do.....		B.		77294-92.....		4		2,380		5.1		.51	
		Long Branch No. 1.....		No. 2 Gas.....		B.		21406-07.....		3		2,490		5.70		1.00	
		Do.....		Eagle No. 1.....		B.		77215-17.....		6		2,520		3.49		.69	
		Do.....		No. 2 Gas (77 per cent) and Eagle (23 per cent).....		B.		77498.....		1		2,800		3.50		.86	
		Do.....		No. 2 Gas.....		B.		77218-22.....		5		2,920		4.65		.81	
		Martins.....		do.....		B.		10014, 24055-60.....		7		+2,940		6.31		.92	

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, per centage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1										
WEST VIRGINIA— Continued.										
PAYETTE COUNTY— continued.										
Minden	Minden No. 2	Sewell		68113, 127, 133.	3	2, 280	2, 640	2, 450	3.23	0.65
Do.	Minden No. 3	do.	B.	68117	1			2, 600	2.86	.96
Do.	Minden No. 4	do.	B.	68124-25, 131	3	2, 270	2, 710	2, 550	2.57	.43
Do.	Minden No. 5	do.	B.	68116, 119, 121	4	2, 080	2, 620	2, 340	3.13	.88
Do.	Rock Lick No. 4	do.	B.	68114, 126, 132	3	2, 370	2, 620	2, 520	2.43	.45
Do.	Catharine (run-of-mine, 25 tons)	do.	S. B.	76893	1			2, 450	7.13	1.03
Mount Hope										
Do.	Catharine	do.	S. B.	77169-70	2	2, 350	2, 620	2, 490	4.38	1.12
Do.	Hi-Tep (run-of-mine, 1 car)	do.	S. B.	76890	1			2, 430	4.35	.83
Do.	Mill Creek No. 1	do.	S. B.	76928-29	2	2, 250	2, 370	2, 310	3.60	1.56
Do.	Minute Bell	do.	S. B.	77173-74	2	2, 450	2, 660	2, 560	3.66	.91
Do.	Minute Bell (run-of-mine, 1 car)	do.	S. B.	76877	1			2, 450	4.74	1.32
Do.	Pack's Branch	Eagle	B.	77203-04	2	2, 980	3, 000	3, 000	6.96	.76
Do.	Sugar Creek (run-of-mine, 5 cars)	Sewell	S. B.	76805	1			2, 410	5.25	1.04
Do.	Warner (run-of-mine, 30 tons)	do.	S. B.	76892	1			2, 270	9.56	1.86
Do.	Warner	do.	S. B.	77171-72	2	2, 230	2, 800	2, 520	4.60	1.62
Oakwood	Oakwood (run-of-mine, 10 cars)	do.	S. B.	77030	1			2, 450	6.83	1.01
Page	Ansted (car sample, run-of-mine)	No. 2	B.	9673	1			2, 430	6.61	1.81
Do.	Page (run-of-mine, 12 cars)	Eagle and Ansted	B.	76851	1			2, 680	9.81	1.41
Do.	Page No. 1 Gas.	No. 1 Gas.	B.	76945-46	2	2, 850	2, 960	2, 910	5.83	.88
Do.	Page No. 2 Gas.	No. 2 Gas.	B.	77200-02	3	2, 340	2, 400	2, 360	6.94	2.25
Do.	Wetwood	Sewell	S. B.	92598-99	2	2, 400	2, 400	2, 400	6.31	.95
Pax	Pax Branch (run-of-mine, approximately 100 tons)	Upper Eagle	B.	76887	1			2, 740	12.51	1.15
Do.										
Scarbro	Scarbro (run-of-mine, 8 cars)	Sewell	S. B.	76992	1			2, 450	5.05	.95
South Nuttal	Brown	do.	S. B.	10620-22	3	2, 580	2, 830	2, 730	2.55	.55

Summerlee.....	Summerlee (run-of-mine, 7 cars).....	B.	77091.....	1	.....	2,310	4.22	.70
Do.....	do.....	B.	77179-82.....	4	2,260	2,600	2.60	.81
Sun.....	New River (run-of-mine, 13 cars).....	S. B.	76817.....	1	.....	2,440	6.16	1.03
Do.....	Sun No. 1.....	S. B.	9741, 44, 47, 50, 53.....	5	2,070	2,550	6.14	1.69
Do.....	Sunset (run-of-mine, 1 car).....	S. B.	77175-76.....	2	2,260	2,420	3.97	.92
Do.....	Fire Creek.....	S. B.	76807.....	3	2,180	2,380	5.91	.74
Thayer.....	Rock Lick No. 2.....	S. B.	10629, 10664, 730.....	3	2,210	2,370	7.46	.78
Thurmond.....	Whipple (run-of-mine, 7 cars).....	S. B.	68128-30.....	3	2,310	2,380	4.90	.68
Whipple.....	Sewell.....	S. B.	76891.....	1	.....	2,310	4.52	.74
Willis Branch.....	Alma.....	B.	77165.....	1	.....	2,880	10.46	.71
Do.....	Willis Branch.....	B.	76831-33.....	3	2,870	2,910	5.55	.76
GRANT COUNTY.								
Henry.....	Henry or No. 22.....	S. B.	26579.....	1	.....	2,190	6.17	1.97
GREENBRIER COUNTY.								
Richwood.....	Spruce Knob.....	B.	13547.....	1	.....	2,940	6.04	.65
HANCOCK COUNTY.								
Chester.....	Allison coal bank.....	B.	25633.....	1	.....	2,130	6.64	1.88
Do.....	Jones coal bank.....	B.	25635.....	1	.....	2,130	6.15	4.04
Do.....	Line Island coal bank.....	B.	25691.....	1	.....	2,110	10.59	4.06
Do.....	Sprouts coal bank.....	B.	25634.....	1	.....	2,070	12.55	4.29
New Cumberland.....	Crescent.....	B.	25716.....	1	.....	2,280	13.65	9.20
Do.....	Lower Kittanning.....	B.	25714.....	1	.....	2,300	4.13	2.16
Do.....	Martin coal bank.....	B.	25715.....	1	.....	2,140	6.13	2.15
Do.....	McNiel-Herron coal bank.....	B.	25713.....	1	.....	2,080	5.28	2.05
Do.....	Wern coal bank.....	B.	.....	.....	.....	.....	.....	.....
HARRISON COUNTY.								
Lost Creek.....	Calif.....	B.	22321-23, 25.....	4	2,000	2,140	8.08	2.24
Do.....	Righter No. 1.....	B.	22332-36.....	5	2,050	2,370	6.07	1.66
KANAWHA COUNTY.								
Putney.....	Putney No. 1.....	B.	23892-96.....	5	2,350	+3,010	9.87	1.11
Ward.....	Kelly's Creek No. 3.....	B.	23919-24.....	6	2,750	+3,010	8.51	.74
LOGAN COUNTY.								
Accoville.....	Big Eagle.....	B.	23407-12.....	6	2,730	2,960	6.08	.65
Do.....	Island Creek.....	B.	23414-18.....	5	2,520	+3,010	5.82	1.28
Craneco.....	Lorado No. 1.....	B.	23609-12.....	3	2,470	+3,010	5.65	.75
Earling.....	Earling No. 1.....	B.	23639, 41-42.....	3	2,800	+3,010	5.07	.70
Omar.....	Main Island Creek No. 5.....	B.	23614-18.....	5	2,390	2,900	5.62	.88

Do.	Havaco (run-of-mine, 4 cars)	do.	S. B.	30237	1	2,660	2,240	8.19	81
Hemphill	Welch	Welch	S. B.	26582-85, 87	5	2,970	2,840	7.41	62
Huger	Lake Superior No. 1	Pocahontas No. 3	S. B.	26348-53	6	2,370	2,310	4.66	73
Do.	Middle States	Pocahontas No. 4	S. B.	14421	1	2,280	2,420	8.78	86
Do.	do.	do.	S. B.	14416-19, 22-23	1	2,100	2,390	6.04	63
Jenkinjones	Jenkinjones No. 6	Pocahontas No. 3	S. B.	14185-87, 89-90, 20518-23, 68083, 90, 96.	14	2,170	2,250	5.03	51
Do.	Jenkinjones No. 8 (run-of-mine, 8 cars)	do.	S. B.	30256	1		2,280	5.9	50
Do.	Jenkinjones No. 7	do.	S. B.	20507-11, 67985, 87, 68029, 99.	9	2,120	2,270	3.92	53
Do.	Jenkinjones No. 8	do.	S. B.	20531-35, 68088- 89, 93, 95.	9	2,190	2,320	5.16	59
Do.	Jenkinjones No. 8 (run-of-mine, 34 cars)	do.	S. B.	30239	1		2,280	6.88	54
Kimball	Carswell	Pocahontas Nos. 3 and 4	S. B.	68033, 34-35	3	2,190	2,270	6.4	48
Leckie	Leckie No. 1	Pocahontas No. 3	S. B.	14271-76	5	2,510	2,830	3.32	57
Do.	Leckie No. 2	do.	S. B.	14277-81	6	2,510	2,710	3.39	55
Lex	Central West	Pocahontas No. 3	S. B.	17469-70	2	2,730	2,640	3.39	55
Lick Branch	Delta	Pocahontas No. 5	S. B.	67891, 94, 967	3	2,190	2,870	7.80	65
Do.	Delta (car sample, 11 cars)	do.	S. B.	30260	1		2,210	4.30	45
McDowell	McDowell	do.	S. B.	68006-07, 10	3	2,420	2,370	7.71	50
Marytown	Marytown	Sewell	S. B.	68002-03	2	2,520	2,450	3.93	43
Newhall	Berwind No. 6	Pocahontas No. 3	S. B.	68066, 75	2	2,540	2,600	8.95	75
Do.	Berwind No. 6 (run-of-mine, 9 cars)	do.	S. B.	30235	1		2,810	4.90	63
Do.	Berwind No. 7	do.	S. B.	68146, 48, 64	3	2,520	2,660	9.53	80
Do.	Berwind No. 8	do.	S. B.	68071, 78-79	3	2,520	2,610	4.27	63
Do.	Berwind No. 8 (run-of-mine, 8 cars)	do.	S. B.	30262	1		2,690	4.43	65
Roderfield	Davy Pocahontas No. 1	Beckley (War Creek)	S. B.	14266-68	3	2,520	2,720	11.31	82
Do.	Davy Pocahontas No. 2	Sewell	S. B.	14262-64	3	2,430	2,770	6.43	89
Rolle	Rolle	Pocahontas No. 3	S. B.	14394-98, 400	6	2,220	2,400	4.42	52
Susana	Yukon-Pocahontas	Beckley (War Creek)	S. B.	14426-29	4	2,370	2,620	8.50	57
Twin Branch	J. B. B. No. 1	Sewell	S. B.	68001	1		2,450	3.1	55
Do.	J. B. B. No. 2	do.	S. B.	68004	1		2,440	4.4	55
Do.	J. B. B. No. 3	do.	S. B.	29681	1		3,010	5.27	76
Do.	J. B. B. No. 4	do.	S. B.	67969	1		2,540	5.2	85
Do.	J. B. B. No. 5	do.	S. B.	67967-98	2	2,450	2,550	5.2	85
Do.	J. B. B. (or Maher) No. 4	do.	S. B.	22480-85, 89	2	2,500	2,660	3.0	55
Do.	J. B. B. (or Maher) No. 4 (car sample, run-of-mine)	do.	S. B.	22487-88	2	2,680	2,930	4.51	71
Vivian	Carswell	do.	S. B.	2314-16	2		2,690	4.22	68
Do.	King	Pocahontas No. 3	S. B.	68024-25, 27, 30	3	2,160	2,920	6.81	61
Do.	King (car sample, 11 cars)	do.	S. B.	30261	4		+	+	44
Do.	King No. 98	do.	S. B.	24800	1		2,280	8.05	56
Do.	Norfolk (car sample)	do.	S. B.	11247, 780	1		2,280	4.53	58
Do.	Tidewater	do.	S. B.	68005, 08-09	2	2,690	2,710	10.33	55
Do.	Tidewater (run-of-mine, 15 cars)	do.	S. B.	30236	2	2,240	2,300	5.63	55
Do.	do.	do.	S. B.		1		2,330	8.55	55

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
I										
WEST VIRGINIA— (continued.)					2	3	4	5	6	7
M'DOWELL COUNTY— continued.										
War.	John's Branch.	Beckley (War Creek).	S. B.	14468-71.	4	2,650	+3,010	+2,860	8.99	0.63
Do.	War Creek.	do.	S. B.	14465-67.	3	2,730	2,750	2,740	8.62	.72
Welch.	Oregon No. 2.	Pocahontas No. 4.	S. B.	14215-16.	2	3,010	3,010	3,010	7.52	.53
Do.	Oregon No. 3.	do.	S. B.	14212-14.	3	2,960	+3,010	+2,980	7.02	.63
Do.	Standard Pocahontas.	Pocahontas No. 3.	S. B.	12512-13.	2	2,430	2,470	2,450	7.36	.97
MARION COUNTY.										
Chiefton.	Consolidation No. 47.	Pittsburgh.	B.	28570-75.	6	2,040	2,170	2,090	7.41	2.97
Farmington.	Consolidation No. 38.	do.	B.	28106-07, 11.	3	2,110	2,150	2,130	6.97	2.29
Hutchinson.	Consolidation No. 87.	do.	B.	28505-08.	4	2,010	2,330	2,230	6.61	1.23
Monongah.	Consolidation No. 84.	do.	B.	28432-35, 69-70.	6	2,010	2,310	2,230	7.12	1.98
Do.	Consolidation No. 43.	do.	B.	28200-11, 25-27.	6	2,170	2,350	2,270	6.27	1.07
Do.	Consolidation No. 63.	do.	B.	11431-32, 28323-26.	6	2,200	2,330	2,270	5.84	1.07
Montana Station.	Parker Run.	Sewickley.	B.	15067-71.	5	2,050	2,120	2,080	9.61	3.99
Watson.	Consolidation No. 26.	Pittsburgh.	B.	28130-42, 44.	5	2,000	2,260	2,110	6.65	1.87
Worthington.	Annabelle.	do.	B.	28535-38.	1	2,340	2,410	2,340	6.15	.82
Do.	Consolidation No. 86.	do.	B.	28535-38.	4	2,240	2,410	2,340	6.15	.80
Do.	Hutchinson.	do.	B.	11153-55.	3	2,070	2,170	2,130	8.70	2.25
MARSHALL COUNTY.										
Benwood.	Hitchman.	Pittsburgh.	B.	25003-10.	5	1,940	1,990	1,970	8.36	4.64
Moundsville.	Mound.	do.	B.	18422-23.	2	2,020	2,130	2,080	12.44	6.09
Do.	Panama.	do.	B.	14486-87.	2	2,070	2,090	2,080	7.29	3.33
MERCER COUNTY.										
Algonquin.	Algonquin.	Pocahontas No. 3.	S. B.	77296-08.	3	2,730	2,840	2,770	4.60	.56
Coaldale.	Coaldale.	do.	S. B.	57890, 97, 995.	3	2,500	2,540	2,410	4.07	.70
Crystal.	Crystal No. 1.	do.	S. B.	24653, 67984, 88.	3	2,560	2,610	2,590	6.37	.55
Do.	Crystal No. 2.	do.	S. B.	67994, 68014-15, 17.	4	2,410	2,520	2,480	4.50	.64
Do.	Godfrey.	do.	S. B.	14258-59, 61.	3	2,370	2,580	2,490	3.88	.73

Goodwill.....	do.	14163-66.....	4	2,540	2,710	2,620	3.37	58
Do.....	do.	14207.....	1	.....	.....	2,410	3.43	59
Do.....	do.	14191-94.....	1	2,490	2,710	2,640	3.82	53
Do.....	do.	14206.....	1	.....	.....	2,090	3.25	55
McComas.....	do.	67911, 928, 932.....	3	2,430	.....	2,940	4.47	50
Do.....	do.	29650, 68012-13, 16.....	3	2,460	.....	2,510	3.87	43
Matoka.....	do.	14231-36.....	4	2,430	.....	2,520	3.85	77
Do.....	do.	14231-38.....	2	2,580	.....	2,620	4.34	79
Do.....	do.	67906-08, 12, 14.....	3	2,440	.....	2,520	5.30	54
Do.....	do.	67913, 904, 963, 968.....	5	2,440	.....	2,500	4.95	52
Mora.....	do.	14113-14.....	4	2,390	.....	2,750	3.88	59
Do.....	do.	14113-17.....	2	2,390	.....	2,300	3.88	59
Do.....	do.	14118-22.....	3	2,350	.....	2,600	4.80	55
Do.....	do.	14236-52.....	5	2,350	.....	2,730	4.80	55
Do.....	do.	14236-56.....	3	2,410	.....	2,470	3.48	54
Do.....	do.	67856, 930, 932.....	3	2,470	.....	2,460	3.93	56
Do.....	do.	67863, 931, 961.....	3	2,470	.....	2,510	4.10	59
Do.....	do.	26708-10, 67981-83.....	3	2,370	.....	2,390	3.40	58
Do.....	Pocalontas No. 6.....	26702-04, 06.....	3	2,290	.....	2,380	3.40	60
Do.....	Pocalontas No. 3.....	26702-04, 06.....	6	2,600	.....	2,740	2.88	70
Do.....	do.	26697-700.....	4	2,510	.....	2,640	3.66	59
Do.....	do.	14224-26, 28, 67936, 965-66.....	7	2,510	.....	2,720	3.67	57
Do.....	do.	30233.....	1	2,490	3,010	2,660	4.00	58
Do.....	do.	14227, 30.....	1	.....	.....	2,600	8.33	58
Do.....	do.	10422-26.....	2	2,450	2,570	2,510	3.68	66
Do.....	Pocalontas No. 4 (?).....	.....	4	2,690	2,890	2,800	5.73	52
Do.....	Thomas.....	75355-57.....	3	2,130	2,640	2,340	9.76	1.82
Do.....	Coalburg.....	17467.....	1	.....	.....	3,010	12.40	1.08
Do.....	Cedar Grove (Thacker).....	17480.....	1	.....	.....	2,320	6.05	2.10
Do.....	Winfrede.....	17463.....	1	.....	.....	3,010	8.14	83
Do.....	Coalburg.....	17466.....	1	.....	.....	3,010	9.12	84
Do.....	Cedar Grove (Thacker).....	17483.....	1	.....	.....	2,600	3.51	68
Do.....	Red Jacket.....	17474.....	1	.....	.....	2,690	7.71	1.69
Do.....	No. 2 or Gas.....	17473.....	1	.....	.....	2,540	3.78	66
Do.....	Cedar Grove (Thacker).....	17484.....	1	.....	.....	2,620	7.16	1.18
Do.....	do.....	17485.....	1	.....	.....	2,490	6.24	1.04
Do.....	do.....	17486-87.....	2	2,410	2,460	2,440	6.35	73
Do.....	Winfrede.....	17482.....	1	.....	.....	2,520	5.01	1.39
Do.....	Cedar Grove (Thacker).....	17494.....	1	.....	.....	2,520	8.10	68
Do.....	Winfrede.....	17481.....	1	.....	.....	2,390	8.28	1.98
Do.....	do.....	17462.....	1	.....	.....	3,000	5.11	71
Do.....	Pittsburgh.....	31621-24.....	4	1,970	1,940	1,980	8.23	3.70
Do.....	Elm Grove No. 1.....		1					

OHIO COUNTY.

Elm Grove.....	Elm Grove No. 1.....		1					
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Do.	Battleship (run-of-mine, 3 cars).	S. B.	76197.	1	2, 460	2, 860	2, 510	6.71	.88
Do.	Wilton No. 1.	S. B.	76917-19.	3			2, 710	4.79	.94
Beckley.	Beckley (run-of-mine, 11 cars).	S. B.	77414.	1	2, 450	2, 450	2, 390	4.40	1.04
Do.	City No. 1.	S. B.	77185-86.	2			2, 450	2.23	.70
Do.	City No. 1 (run-of-mine, 15 tons).	S. B.	76389.	1			2, 430	5.70	.83
Do.	City No. 2 (run-of-mine, 1 car).	S. B.	77415.	1			2, 530	5.10	.85
Besico.	Beckley Smokeless.	S. B.	77187-89.	3	2, 320	2, 740	2, 660	2.79	.63
Do.	Clyde Pocahontas.	S. B.	76235-86.	2	2, 800	2, 950	2, 920	4.10	.66
Do.	Clyde Pocahontas (run-of-mine, 2 cars).	S. B.	78522.	1			2, 850	10.21	.65
Big Stick.	Big Stick.	S. B.	26694-86, 88-89, 68418, 34-35.	8	2, 700	+3, 010	+2, 950	4.20	.55
Do.	Big Stick (run-of-mine, 12 cars).	S. B.	78669.	1			2, 870	7.61	.57
Capeco.	Callaway (run-of-mine, 2 cars).	S. B.	76378.	1			2, 340	8.28	.99
Cranberry.	Cranberry.	S. B.	29274-75.	2	2, 460	2, 480	2, 470	2.68	.55
East Gulf.	Mead No. 1.	S. B.	76369-71.	3	2, 250	2, 800	2, 620	6.62	1.03
Eccles.	Eccles No. 3 (run-of-mine, 6 cars).	S. B.	78921.	1			2, 790		
Do.	Eccles No. 5.	S. B.	19774-78.	5	2, 550	+3, 010	+2, 920	6.44	.78
Do.	Eccles No. 5 (run-of-mine, 8 cars).	S. B.	78922.	1			2, 800	6.44	.79
Do.	Eccles No. 6 (run-of-mine, 9 cars).	S. B.	77316.	1			2, 350	4.61	1.10
Fireco.	Douglas No. 2.	S. B.	76387-90.	4	2, 570	2, 750	2, 660	4.08	.84
Do.	Douglas No. 2 (run-of-mine, 10 cars).	S. B.	77723.	1			2, 570	5.88	.95
Do.	Leckie No. 1.	S. B.	76914-15.	2	2, 750	2, 750	2, 750	5.01	.76
Do.	Leckie No. 2.	S. B.	76307-09.	3	2, 730	2, 800	2, 760	4.80	.80
Do.	Leckie No. 2 (run-of-mine, 6 cars).	S. B.	77595.	1			2, 570	7.15	.92
Do.	Lillybrook No. 2.	S. B.	76481-83.	3	2, 540	2, 940	2, 720	4.11	.91
Do.	Lillybrook No. 2 (run-of-mine, 6 cars).	S. B.	77722.	1			2, 600	5.57	1.09
Glen White.	Glen White (run-of-mine, 27 cars).	S. B.	78289.	1			2, 710	7.73	.97
Helen.	East Gulf No. 3.	S. B.	76278-80.	3	2, 600	2, 700	2, 710	3.39	.60
Do.	East Gulf No. 4.	S. B.	76283-85.	3	2, 570	2, 960	2, 780	4.02	.58
Do.	East Gulf No. 5.	S. B.	76301-03.	3	2, 850	2, 970	2, 800	4.59	.63
Do.	Helen Nos. 3 and 4 (run-of-mine, 32 cars).	S. B.	78229.	1			2, 790	7.02	.62
Do.	Helen No. 5 (run-of-mine, 3 cars).	S. B.	78240.	1			2, 790	7.37	.73
Hotoal.	Big Stick.	S. B.	14375-77.	3	2, 960	+3, 010	+2, 990	4.95	.69
Do.	Gulf (Hotoal).	S. B.	76924-27, 68.	5	2, 600	+3, 000	+2, 810	4.05	.72
Do.	Gulf (Hotoal, run-of-mine, 10 cars).	S. B.	78568.	1			2, 960	6.50	.62
Lego.	Fire Creek.	S. B.	77191-93.	3	2, 680	2, 910	2, 820	5.46	.92
Do.	Laurel Smokeless.	S. B.	76542-43.	2	2, 730	2, 830	2, 780	4.49	.82
Do.	Laurel Smokeless (run-of-mine, 1 car).	S. B.	78653.	1			2, 820	8.94	.74

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, per-centage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
I										
WEST VIRGINIA—Continued.										
RALEIGH COUNTY continued.										
Lester.....	Lester Smokeless (run-of-mine, 13 tons).	Sewell.	S. B.	77266.....	1			2,440	10.46	1.63
Do.....	Neal (run-of-mine, 2 cars).	do.	S. B.	76951-52.....	2	2,390	2,730	2,570	4.88	1.00
Do.....	Lillybrook No. 1.....	do.	S. B.	76501.....	1			2,510	12.43	1.37
Lillybrook.....	Fire Creek.....	do.	S. B.	76398-401.....	4	2,410	2,800	2,660	4.79	.97
Do.....	Lillybrook No. 1 (run-of-mine, 84 cars).	do.	S. B.	76241.....	1			2,770	6.22	.88
Do.....	Lilly and Hornbrook No. 3.....	Pocahontas No. 6.	S. B.	76551-52.....	2	2,740	2,740	2,740	5.13	.83
Do.....	Lilly and Hornbrook No. 3 (run-of-mine, 2 cars).	do.	S. B.	76183.....	1			2,670	9.45	.90
McAlpin.....	McAlpin (run-of-mine, 21 cars).	Beckley.	S. B.	68259-60.....	2	2,730	+3,010	+2,870	2.65	.65
Do.....	Blue Jay No. 4.....	do.	S. B.	77720.....	1			2,790	7.62	.64
McQuade Station.....	Mabscott (run-of-mine, 9 cars).	do.	S. B.	14288-90.....	3	2,730	+3,020	+2,830	4.38	.75
Mabscott.....	Summit (run-of-mine, 6 cars).	Sewell.	S. B.	77413.....	1			2,390	5.70	1.23
Metaton.....	Lynwin (run-of-mine, 6 cars).	Beckley.	S. B.	79313.....	1			2,560	6.91	.89
Mistletoe.....		Beckley.	S. B.	14319-23, 68136-37, 76896-98.	10	2,620	+3,010	+2,900	3.99	.74
Do.....	Lynwin (run-of-mine, 6 cars).	do.	S. B.	79034.....	1			2,740	8.33	.67
Morco.....	Morco (run-of-mine, 1 car).	Pocahontas No. 3.	S. B.	75768.....	1			2,730	15.06	.50
Mount Hope.....	Cepeco No. 1.....	Sewell.	S. B.	76948-49.....	2	2,090	2,200	2,150	4.92	2.37
Oswald.....	Oswald (run-of-mine, 4 cars).	do.	S. B.	77134.....	1			2,450	4.59	.83
Do.....	Oswald No. 3.....	do.	S. B.	68165, 69-70.....	3	2,190	2,590	2,380	4.07	.80
Pemberton.....	Pemberton (run-of-mine, 4 cars).	Beckley.	S. B.	76892-94.....	3	2,810	+3,000	+2,920	5.43	.67
Do.....	Pemberton (run-of-mine, 4 cars).	do.	S. B.	78557.....	1			2,820	7.34	.75
Do.....		do.	S. B.		3	2,800	+3,000	+2,930	6.20	.59
Do.....	Ragland (run-of-mine, 5 cars).	do.	S. B.	77223-25.....	1			2,900	7.46	.68
Do.....	Ragland (run-of-mine, 5 cars).	do.	S. B.	77531.....	1			2,280	5.37	1.37
Price Hill.....	Price Hill (run-of-mine, 7 cars).	Sewell.	S. B.	76379.....	1			2,560	3.33	.6
Prince Wick.....	Prince Wick.....	Beckley.	S. B.	76317-20.....	4	2,150	2,890	2,520	4.83	.59
Prosperity.....	Cranberry No. 1 (run-of-mine, 16 cars).	Sewell.	S. B.	77412.....	1					

Raleigh	Raleigh No. 1	Beckley	S. B.	10630					+3,010	3.70	.65
Do.	Raleigh Nos. 1 and 4 (run-of-mine, 3 cars)	do.	S. B.	77499					2,730	4.45	.69
Do.	Raleigh No. 3	do.	S. B.	10624-27		2,620	2,750		2,670	3.67	.75
Do.	Raleigh No. 3 (run-of-mine, 8 cars)	do.	S. B.	77593					2,720	4.32	.71
Do.	Raleigh No. 6 (run-of-mine, 14 cars)	do.	S. B.	77500					2,730	5.36	.86
Rhodell	Rhodell No. 1	Pocahontas No. 3	S. B.	76236-37			2,910	2,910	2,910	4.65	.88
Do.	Rhodell Nos. 1 and 2 (run-of-mine, 3 cars)	Beckley, 80 per cent; and Pocahontas No. 3, 20 per cent.	S. B.	78080					2,910	9.43	.67
Do.	Rhodell No. 2	Beckley	S. B.	76229-30		2,800	2,850		2,830	5.68	.82
Stetson	Cranberry No. 2 (run-of-mine, 9 cars)	Sewell	S. B.	76072-75		2,490	2,850		2,460	2.99	.73
Do.	Cranberry No. 2	do.	S. B.	78574					2,740	5.45	.81
Slab Fork	Slab Fork No. 1 (run-of-mine, 16 cars)	Beckley	S. B.	14337					2,580	2.87	.61
Do.	Slab Fork No. 1	do.	S. B.	77328					2,800	5.53	.71
Do.	Slab Fork No. 2	do.	S. B.	14325-26	28-30, 68154, 54, 61.	2,480	+3,010		+2,740	3.69	.50
Do.	Slab Fork No. 2 (run-of-mine, 34 cars)	do.	S. B.	77329					2,800	5.87	.69
Do.	Slab Fork No. 3	do.	S. B.	14332-34	68155, 57, 60, 84.	2,370	+3,010		+2,740	4.03	.54
Do.	Slab Fork No. 4	do.	S. B.	14356					2,960	2.39	.55
Do.	Slab Fork No. 5	do.	S. B.	14313-16, 18, 68150-52.		2,520	+3,010		+2,760	3.49	.50
Sprague	Cranberry No. 3 (run-of-mine, 12 cars)	Sewell	S. B.	77411					2,520	4.48	.83
Stanford	Elkton Piney No. 6	do.	S. B.	77228-28		2,130	2,730		2,520	2.92	1.22
Stationsbury	White No. 3	Beckley	S. B.	76942-46		2,800	2,910		2,880	4.70	.60
Do.	Stationsbury (run-of-mine, 21 cars)	do.	S. B.	77785					2,760	5.39	.66
Sullivan	Piney Creek No. 1	do.	S. B.	76900-01		2,510	2,580		2,550	6.44	1.25
Do.	Sullivan (run-of-mine, 4 cars)	do.	S. B.	76343					2,570	6.42	1.02
Tanroy	Tanroy	Sewell	S. B.	68166-68		2,540	+3,010		+2,850	1.97	.50
Do.	Tanroy (run-of-mine, 4 cars)	do.	S. B.	77132					2,440	4.93	.85
Tans	Tans (run-of-mine, 18 cars)	Beckley	S. B.	78559					2,790	4.99	.57
Do.	Tans No. 1	do.	S. B.	68096					+3,010	6.2	.50
Do.	Tans No. 3	do.	S. B.	68084					+3,010	3.5	.45
Do.	Tans No. 4	do.	S. B.	68080					3,010	4.3	.70
Talbert	Crabb Orchard (run-of-mine, 185 tons)	Sewell	S. B.	78793					2,520	7.60	.82
Tommy Creek	Tommy Creek (run-of-mine, 1 car)	Pocahontas No. 3	S. B.	76108					2,730	7.43	.72
Vanwood	Beckley No. 1	Beckley	S. B.	76538-40		2,510	2,830		2,630	3.32	.64
Do.	Wood-Sullivan (run-of-mine, 14 cars)	Beckley and Pocahontas No. 3	S. B.	76109					2,700	7.24	.62
Do.	Wood-Sullivan No. 3	do.	S. B.	76534-35		2,590	2,890		2,740	4.53	.71
Viacova	Viacova (run-of-mine, 2 cars)	Sewell	S. B.	76580					2,800	16.09	.63
Do.	Viacova	do.	S. B.	77138-84		2,910	2,910		2,910	12.95	.54

Do.	Miller Pocahontas.	76157-59.	3	2,810	2,860	5.44	.66
Do.	Virginia Smokeless.	76151-54.	4	2,820	2,910	6.21	.72
Do.	Virginia Smokeless (run-of-mine, tippie sample).	75917.	1			11.85	.65
Crabb Orchard.	Devil's Fork (run-of-mine, 4 cars).	76911-12.	2	2,440	2,620	4.67	1.04
Do.	Sewell.	76012.	1			6.33	.70
Do.	Pocahontas No. 3.						
Do.	Devil's Fork.						
Do.	Clagette.	76288-90.	3	2,820	2,910	6.41	.65
Herndon.	Pocahontas No. 6.	76087-88.	2	2,450	2,700	5.98	.68
Do.	Flat Top (run-of-mine, 2 cars).	78949.	1			10.66	.75
Do.	Pocahontas Nos. 3 and 6.					2,740	
Do.	Pocahontas No. 3.	76995-97.	3	2,740	2,800	5.01	.52
Do.	Iroquois (run-of-mine, 5 cars).	75984.	1			2,900	.66
Do.	Iroquois.	76224-26.	3	2,800	2,960	6.43	.69
Do.	Morris Smokeless No. 1.	76162-63.	2	2,800	2,800	6.36	.57
Do.	Mullens (run-of-mine, 1 tippie sample car).	76013.	1			11.84	.79
Do.	Mullens Smokeless.					2,850	
Do.	Otsego.	75876-77.	2	2,850	3,000	6.43	.71
Do.	Sabine.	75960-62.	3	2,680	2,940	9.22	.82
Do.	Sabine (run-of-mine tippie sample).	75900-02.	3	2,260	2,460	3.35	.88
Do.	Trace Fork.	75918.	1			4.41	.72
Do.	Trace Fork (run-of-mine, 6 cars).					10.17	
Do.	Pocahontas No. 3.	75861-63.	3	2,910	3,010	6.67	.72
Do.	Trace Fork.	78338.	1			12.27	.94
Do.	Parker's Creek No. 1.						
Do.	Parker's Creek No. 2.	75993-95.	3	2,570	2,620	4.81	.71
Do.	Barker's Creek No. 2 (run-of-mine, 1 car).	76014-15.	2	2,390	2,570	5.63	.53
Do.	Barker's Creek No. 3 (run-of-mine, 1 car).	78675.	1			6.38	.51
Do.	Barker's Creek No. 3.						
Do.	Barker's Creek No. 3 (run-of-mine, 1 car).	75988-90.	3	2,570	2,620	5.37	1.20
Do.	Cooper No. 1 (run-of-mine, 8 cars).	75691.	1			10.01	.49
Do.	Mead-Pocahontas.	75758.	1			9.88	.86
Do.	Mead-Pocahontas (run-of-mine, 5 cars).	76871-873.	3	2,620	2,980	6.18	.78
Do.	Mead-Pocahontas (run-of-mine, 5 cars).	75692.	1			6.60	.74
Do.	Trace No. 2.						
Do.	Trace No. 2 (run-of-mine, 9 cars).	76017-19.	3	2,740	2,860	5.53	.64
Do.	Trace No. 2 (run-of-mine, 9 cars).	75690.	1			2,620	.67
Do.	Wyco.	76293-97.	5	2,850	3,000	7.41	.63
Do.	Wyco (run-of-mine, tippie sample).	75920.	1			8.39	.70
WYOMING.							
CAMPBELL COUNTY.							
Do.	Country bank.	22973.	1			14.66	2.06
Do.	Local.	22885.	1			11.03	1.96
Do.	Prospect.	22904.	1			9.31	1.76
CARBON COUNTY.							
Do.	Local.	22972.	1			5.18	1.20
Do.	Johnston.	22800.	1			7.91	.98
Do.	Medicine Bow.	22792.	1			9.39	1.32
Do.	Rock River.						

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature ° F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
1						3	4	5	6	7
WYOMING—Con.										
CONVERSE COUNTY.										
Big Muddy	Big Muddy	Lower Big Muddy	Sb. B.	17723	1			2,100	9.15	0.77
Do.	do.	Upper Big Muddy	Sb. B.	17722	1			2,240	8.37	.97
Douglas	Country bank	Lower Burned	Sb. B.	11442	1			2,090	11.65	.50
Glenrock	Country bank	Unamed	Sb. B.	11048	1			2,360	6.42	.63
Do.	do.	do.	Sb. B.	17657	1			2,210	7.15	.92
Do.	do.	Fairview	Sb. B.	17658	1			2,110	7.79	.55
Do.	do.	Glenrock	Sb. B.	17658	1			2,110	9.61	.55
Do.	do.	Prospect	Sb. B.	17902	1			2,110	15.30	1.68
Inez	Diamond	do.	Sb. B.	14781	1			2,110	15.30	1.68
Do.	do.	do.	Sb. B.	14754	1			2,180	11.54	.98
Do.	do.	do.	Sb. B.	10911	1			1,990	10.49	1.13
Lost Spring	Harney Creek	do.	Sb. B.	10711	1			2,310	7.77	1.27
Do.	Haynes	do.	Sb. B.	10740	1			2,010	5.93	1.37
Do.	Onyon	do.	Sb. B.	11447	1			2,260	13.81	1.42
Do.	Prospect	"D"	Sb. B.	10775	1			2,170	13.81	1.42
Do.	Rosin	Unamed	Sb. B.	10775	1			2,320	16.65	.80
Do.	Sunset	do.	Sb. B.	10835	1			2,320	16.65	.80
CROOK COUNTY.										
Sundance	Belshe	Unamed	B.	15713-15	3	2,150	2,490	2,260	14.99	6.09
FREMONT COUNTY.										
Dubois	Prospect	Unamed	Sb. B.	17584	1			2,180	15.84	4.00
Hudson	Hickey	do.	Sb. B.	17247	1			2,130	5.46	.90
Do.	Indian	do.	Sb. B.	10838-41, 43, 13178-79	7	2,000	2,260	2,130	7.26	.64
Do.	Do.	Mesa Verde	Sb. B.	21408-10	3	2,080	2,250	2,140	9.45	1.46
Do.	McKinley	Unamed	Sb. B.	9773, 17248	2	2,240	2,310	2,300	9.55	.98
Do.	Mitchell	Unamed	Sb. B.	9773, 17248	2	2,240	2,310	2,300	9.55	.98
Do.	Proposia	Lander	Sb. B.	17244-45	2	2,270	2,280	2,280	5.61	.79
Riverton	Shipton	Unamed	Sb. B.	9772	1			2,320	9.42	.90

HOT SPRINGS COUNTY.		Big Horn.	Gebo.	15202, 09, 14, 17, 19.	5	2, 050	2, 380	2, 170	5.58
Crosby	do.	Gebo.	do.	15277-82, 15343-44,	15	1, 860	2, 210	2, 020	6.40
Kirby	do.	do.	do.	46, 48, 2447-51.					
Do.	Gwynn prospect.	do.	"B."	17830	1			2, 380	16.11
Do.	Dickie No. 1 prospect.	do.	do.	14679	1			2, 510	82
Do.	Thermopolis.	do.	do.	17731	1			2, 210	1.31
JOHNSON COUNTY.									
Do.	Prospect.	do.	"B."	10683	1			2, 180	9.37
Do.	do.	do.	do.	11059	1			2, 500	18.02
Do.	do.	do.	do.	10804	1			2, 360	9.30
Do.	do.	do.	do.	10728	1			2, 150	10.16
Do.	Puggsley.	do.	do.	10827	1			2, 210	6.75
LINCOLN COUNTY.									
Do.	Elkol.	do.	Elkol.	30735, 62	2	2, 300	2, 420	2, 360	4.06
Do.	Kemmerer.	do.	Kemmerer.	18008-11, 18798,	7	2, 170	2, 310	2, 250	6.73
Do.	Sublet.	do.	No. 5 (Willow Creek).	33023-24.	4	2, 180	2, 240	2, 210	5.72
NATRONA COUNTY.									
Do.	Casper.	do.	do.	17778	1			2, 120	7.18
Do.	do.	do.	do.	17895	1			2, 340	6.79
Do.	do.	do.	do.	10671	1			2, 290	7.60
PARK COUNTY.									
Do.	McGuffey.	do.	do.	12886	1			2, 670	9.49
Do.	Black Diamond.	do.	do.	12887	1			2, 910	9.50
Do.	Greybull.	do.	do.	12888	1			2, 550	14.37
Do.	Eagle.	do.	do.	12885	1			2, 530	13.69
Do.	East Wiley.	do.	do.	12884	1			2, 310	9.23
Do.	West Wiley.	do.	do.	12883	1			2, 370	13.59
SHERIDAN COUNTY.									
Do.	Acme.	do.	Carney.	10823-24, 26, 12687,	16	2, 100	2, 330	2, 250	4.84
Do.	do.	do.	do.	25190, 25217-23,					
Do.	do.	do.	do.	55-58,	5	2, 100	2, 150	2, 130	4.60
Do.	do.	do.	do.	10807-09, 11, 12683,	1			2, 150	3.68
Do.	do.	do.	do.	12684	13	2, 050	2, 270	2, 140	4.48
Do.	do.	do.	do.	15677-80, 25198,					
Do.	do.	do.	do.	25295-98, 25304-07,	6	2, 050	2, 200	2, 140	5.00
Do.	do.	do.	do.	15681-85, 25197,	4	2, 120	2, 270	2, 190	9.26
Do.	do.	do.	do.	25187-88, 25226-27,	8	2, 120	2, 220	2, 180	9.43
Do.	do.	do.	do.	13498-99, 16221-27,	9	2, 040	2, 220	2, 150	1.30
Do.	do.	do.	do.	25290, 02, 89-94,	8				6.64

TABLE I.—Softening temperatures of coal ash from coals of the United States—Continued.

Locality.	Mine.	Coal bed.	Rank of coal.	Laboratory No.	Number of samples from mine.	Softening temperature °F.			Average analysis of dry coal, percentage of—	
						Lowest.	Highest.	Average.	Ash.	Sulphur.
I										
WYOMING—Con.										
SHERIDAN COUNTY—continued.										
Kool	Hughes prospect.	Monarch (?)	Sb. B.	12642.	1	.....	.....	2,150	6.48	0.41
Do.	Kool.	Monarch.	Sb. B.	10818-21, 16660-66, 25263-73.	22	1,970	2,240	2,080	6.36	.83
Monarch.	Monarch.	do.	Sb. B.	12005-06, 08, 19006-08, 54, 25190-91, 25244-50, 52, 53, 25311-13.	21	1,970	2,290	2,190	4.85	.56
Do.	New Monarch.	do.	Sb. B.	12685, 15830-36.	8	2,000	2,490	2,180	4.92	.59
New Acme.	New Acme.	do.	Sb. B.	16055-58.	4	2,150	2,450	2,320	4.32	.57
SWEETWATER COUNTY.										
Gunn.	Gunn-Quealy B.	No. 11.	Sb. B.	11507-09.	3	1,900	2,030	1,970	2.44	1.06
Rock Springs.	Prospect.	Tip-ton.	Sb. B.	22552.	1	.....	.....	1,980	15.33	7.52
Superior.	B.	No. 1 upper.	Sb. B.	10067.	1	.....	.....	2,040	2.91	1.03
Do.	B.	No. 7.	B.	11461-64.	4	2,190	2,410	2,330	3.92	1.05
Do.	C.	No. 1.	Sb. B.	11456-59.	4	2,100	2,390	2,280	3.76	1.12
UINTA COUNTY.										
Elkol.	Elkol.	No. 1.	B.	11730-31.	2	2,380	2,400	2,390	4.61	.75
Frontier.	Kemmerer No. 1.	do.	B.	11565-68.	4	2,060	2,190	2,120	7.13	1.35
Kemmerer.	Prospect.	Unamed.	Sb. B.	11740.	1	.....	.....	1,920	3.05	2.38
Susie.	Kemmerer No. 4.	Kemmerer No. 1.	B.	13517-18.	2	2,040	2,270	2,160	6.82	1.42
WESTON COUNTY.										
Cambria.	Antelope No. 3.	Unamed.	Sb. B.	16128-30.	3	2,600	2,980	2,790	18.38	5.40
Do.	Antelope No. 4.	do.	Sb. B.	16412-14.	3	2,750	2,870	2,810	16.85	5.55
Moorcroft.	Prospect.	do.	Sb. B.	12446.	1	.....	.....	2,400	8.13	.76
Do.	do.	do.	Sb. B.	12392.	1	.....	.....	2,310	9.62	1.31

TABLE II.—Comparison of softening temperatures of coal ash from mine and car samples.

State.	County.	Town.	Mine.	Coal bed.	Type of coal.	Laboratory No.	Number of samples.	Average softening temperature, °F.	Average analysis of dry coal, percentage of—	
									Ash.	Sulphur.
1	2	3	4	5	6	7	8	9	10	11
Illinois	Franklin	Orient	Orient (mine samples)	No. 6 (Herrin)	B.	23442-43	2	2,410	8.99	0.93
	do	do	Orient (egg and lump, 32 cars)	do	B.	30266-67	2	2,190	9.73	1.20
	do	Sesser	Sesser No. 1 (mine samples)	do	B.	26492-96	5	2,210	9.30	1.20
	do	do	Sesser No. 1 (egg and nut, 14 cars)	do	B.	30206, 08; 30485-86	4	2,360	9.84	1.22
	Macoupin	Gillespie	Superior No. 1 (mine samples)	do	B.	18545-46	2	2,130	11.36	1.59
Maryland	do	do	Superior No. 1 (run-of-mine 1 car)	do	B.	18910	1	2,040	13.11	3.79
	Allegany	Midland	Consolidation No. 8 (mine samples)	Pittsburgh (Big Bed)	S. B.	68192-95	2	+3,010	7.35	.72
	do	do	Consolidation No. 8 (tipple samples, run-of-mine)	do	S. B.	68203-09-11-13	4	+3,010	7.33	.88
Pennsylvania	Blair	Glen White	Glen White No. 2 (mine samples)	Upper Freeport	B.	30830-32	3	2,240	6.87	1.96
	do	do	Glen White No. 2 (tipple sample)	do	B.	30834	1	2,120	9.61	1.43
	Cambria	Gallitzin	Gallitzin (mine sample)	do	B.	30824-27	4	2,330	6.27	1.47
	do	do	Gallitzin (car sample)	do	B.	30829	1	2,490	8.79	1.84
	do	Nanty Glow	Lincoln No. 1 (mine sample)	Lower Kittanning	S. B.	12180-84, 22514-19	11	2,370	6.47	1.54
	do	do	Lincoln No. 1 (car sample)	do	S. B.	22521	1	2,130	7.73	1.94
	do	do	Brush Valley (mine samples)	do	S. B.	22501-05	5	2,260	8.09	1.99
	Indiana	Scott Glen	Brush Valley (car sample)	do	S. B.	22507	1	2,130	8.16	2.00
	do	do	Haws No. 3 (mine sample)	do	S. B.	22541-45	5	2,370	8.00	2.43
	Somerset	Halsopple	Haws No. 3 (run-of-mine, car sample)	do	S. B.	22547	1	2,370	9.07	2.71
	do	do	Lechrie Arrow (mine samples)	do	S. B.	20292-95, 98	5	+2,520	6.79	1.44
	do	Windber	Lechrie Arrow (run-of-mine, car sample)	do	S. B.	22534	1	2,460	10.25	2.16
Virginia	Tazewell	Pocahontas	West Pocahontas (mine samples)	Pocahontas No. 3	S. B.	67910, 53-54, 58	4	2,320	4.32	.46
	do	do	West Pocahontas (run-of-mine, 4 cars)	do	S. B.	30264	1	2,190	3.60	.67
	Fayette	Glen Jean	Nichol (mine samples)	Sewell	S. B.	76961-64	4	2,550	5.30	.78
West Virginia	do	do	Nichol (run-of-mine, 5 cars)	do	S. B.	76880	1	2,300	5.25	.78
	do	Ingram Branch	Ingram Branch No. 2 (mine samples)	Big Eagle	B.	77233-36	4	2,630	5.05	1.08
	do	do	Ingram Branch No. 2 (run-of-mine, 14 cars)	do	B.	76504	1	2,780	8.36	.99
Do.	do	do	Lochelly (mine samples)	Sewell	B.	77229-32	4	2,490	2.51	.51
	do	Lochelly	Lochelly (run-of-mine, 6 cars)	do	B.	77090	1	2,680	4.95	.69
	do	do	Long Branch No. 1 (mine samples)	Eagle	B.	77215-17	3	2,780	3.36	.69
	do	Long Branch	do	do	B.	do	do	do	do	do

TABLE II.—Comparison of softening temperatures of coal ash from mine and car samples—Continued.

State.	County.	Town.	Mine.	Coal bed.	Type of coal.	Laboratory No.	Number of samples.	Average softening temperature, °F.	Average analysis of dry coal, percentage of—	
									Ash.	Sulphur.
1	2	3	4	5	6	7	8	9	10	11
West Virginia...	Fayette	Long Branch	Long Branch No. 2 (mine samples).	No. 2 Gas.	B.	77218-22	5	2,810	4.43	0.81
Do.	do.	do.	Long Branch Nos. 1 and 2 (run-of-mine, 16 cars).	Eagle, 23 per cent; and No. 2 Gas, 77 per cent.	B.	76488	1	2,880	8.46	.86
Do.	do.	Mount Hope	Catherine (mine samples).	Sewell	S. B.	77169-70	2	2,490	4.38	1.12
Do.	do.	do.	Minnie Bell (run-of-mine, 25 tons).	do.	S. B.	76383	1	2,450	7.13	1.03
Do.	do.	do.	Minnie Bell (mine samples).	do.	S. B.	77173-74	2	2,560	3.66	.91
Do.	do.	do.	Minnie Bell (run-of-mine, 4 car).	do.	S. B.	76377	1	2,450	4.74	1.32
Do.	do.	do.	Warner (mine sample).	do.	S. B.	77171-72	2	2,520	4.60	1.62
Do.	do.	do.	Warner (run-of-mine, 30 tons).	do.	S. B.	76382	1	2,270	9.56	1.86
Do.	do.	Summertree	Summertree (mine sample).	do.	B.	77179-82	4	2,370	2.60	.81
Do.	do.	do.	Summertree (run-of-mine, 7 cars).	do.	B.	77001	1	2,310	4.22	.70
Do.	do.	Sunset	Sunset (mine sample).	do.	S. B.	77175-76	2	2,340	3.97	.92
Do.	do.	do.	Sunset (run-of-mine, 1 car).	do.	S. B.	76807	1	2,360	5.61	.74
Do.	do.	Willis Branch	Willis Branch (mine sample).	Alma	B.	76831-33	3	2,360	5.55	.76
Do.	do.	do.	Willis Branch (run-of-mine, 1 car).	do.	B.	77165	1	2,850	10.60	.71
Do.	McDowell	Gilliam	Gilliam (mine sample).	Pocahontas No. 3.	S. B.	68060, 122-23	3	2,250	8.40	.45
Do.	do.	do.	Gilliam (run-of-mine, 4 cars).	do.	S. B.	30238	1	2,260	8.05	.44
Do.	do.	Hartwell	Berwind No. 5 (mine sample).	do.	S. B.	68069, 72, 76	3	2,290	4.17	.83
Do.	do.	do.	Berwind No. 5 (run-of-mine, 4 cars).	do.	S. B.	30263	1	2,310	9.35	.96
Do.	do.	Havaco	Havaco (mine sample).	do.	S. B.	10834, 13775, 67996, 68019-20	5	2,350	5.66	.74
Do.	do.	do.	Havaco (run-of-mine, 4 cars).	do.	S. B.	30237	1	2,240	8.19	.81
Do.	do.	Jenkin Jones No. 6	Pocahontas No. 3 (mine sample).	do.	S. B.	14185 - 87, 89 - 90, 20518-23, 68083, 90, 96.	14	2,250	5.03	.51
Do.	do.	do.	Pocahontas No. 3 (car sample, 8 cars).	do.	S. B.	30256	1	2,280	5.9	.50
Do.	do.	Jenkin Jones No. 8	Pocahontas No. 3 (mine samples).	do.	S. B.	20531-35, 68088-89, 93, 95.	9	2,320	5.16	.59
Do.	do.	do.	Pocahontas No. 3 (run-of-mine, 34 cars).	do.	S. B.	30239	1	2,280	6.88	.54
Do.	do.	Lick Branch	Delta (mine sample).	do.	S. B.	67891, 94, 967	3	2,210	4.30	.45

Do.....	do.....	Delta (carsample, 11 cars)	do.....	S. B.	30260.....	1	2,370	7.71	.50
Do.....	Newhall.....	Berwind No. 6 (mine sample)	do.....	S. B.	68066, 75.....	2	2,810	4.90	.63
Do.....	do.....	Berwind No. 6 (run-of-mine, 9 cars)	do.....	S. B.	30236.....	1	2,660	9.53	.80
Do.....	do.....	Berwind No. 8 (mine sample)	do.....	S. B.	68071, 78-79.....	3	2,680	4.43	.65
Do.....	do.....	Berwind No. 8 (run-of-mine, 8 cars)	do.....	S. B.	30262.....	1	2,700	7.59	.70
Do.....	Twin Branch.....	Maher or No. 4 (mine samples)	Sewell.....	S. B.	22480-85, 89.....	8	2,660	4.46	.71
Do.....	do.....	of-mine)	do.....	S. B.	22487-88.....	2	2,680	4.31	.71
Do.....	Vivian.....	King (mine samples)	Pocahontas No. 3.....	S. B.	68024, 25, 27, 30.....	4	+2,420	4.85	.44
Do.....	do.....	King (car samples, 11 cars)	do.....	S. B.	30261.....	1	2,280	8.05	.56
Do.....	do.....	Tidewater (mine samples)	do.....	S. B.	68005, 8-9.....	3	2,270	5.63	.55
Do.....	do.....	Tidewater (run-of-mine, 15 cars)	do.....	S. B.	30236.....	1	2,330	8.55	.51
Do.....	Weyanoke.....	Weyanoke No. 1 (mine sample)	do.....	S. B.	14224-26, 28, 67836, 965-96.....	7	2,660	4.00	.58
Do.....	do.....	Weyanoke No. 1 (car sample, 9 cars)	do.....	S. B.	30233.....	1	2,600	8.33	.58
Do.....	Raleigh.....	Affinity (mine samples)	Beckley.....	S. B.	26691-93, 95, 68115, 122, 123.....	7	+3,000	4.19	.56
Do.....	do.....	Affinity (run-of-mine, 5 cars)	do.....	S. B.	79004.....	1	2,800	7.45	.75
Do.....	Bacontown.....	Battleship (mine sample)	Fire Creek.....	S. B.	76922.....	1	2,510	5.25	1.26
Do.....	do.....	Battleship (run-of-mine, 3 cars)	do.....	S. B.	76197.....	1	2,510	6.71	.88
Do.....	Beckley.....	City No. 1 (mine samples)	do.....	S. B.	77183-86.....	2	2,450	2.23	.70
Do.....	do.....	City No. 1 (run-of-mine, 15 tons)	do.....	S. B.	76389.....	1	2,430	5.70	.83
Do.....	Besoco.....	Clyde Pocahontas (mine samples)	Pocahontas No. 3.....	S. B.	76265-66.....	2	2,920	4.10	.66
Do.....	do.....	Clyde Pocahontas (run-of-mine, 24 cars)	do.....	S. B.	78522.....	1	2,850	10.21	.65
Do.....	Big Stick.....	Big Stick (mine samples)	Beckley.....	S. B.	26684-86, 88-89, 68118, 84-85.....	8	+2,950	4.20	.55
Do.....	do.....	Big Stick (run-of-mine, 84 cars)	do.....	S. B.	78969.....	1	2,870	7.61	.57
Do.....	Ecdes.....	Ecdes No. 5 (mine samples)	do.....	S. B.	19774-78.....	5	+2,920	6.44	.78
Do.....	do.....	Ecdes No. 5 (run-of-mine, 8 cars)	do.....	S. B.	78922.....	2	2,800	6.44	.79
Do.....	Fireco.....	Douglas No. 2 (mine sample)	Fire Creek.....	S. B.	76887-90.....	4	2,660	4.08	.84
Do.....	do.....	Douglas No. 2 (run-of-mine, 10 cars)	do.....	S. B.	77723.....	1	2,570	5.88	.95
Do.....	do.....	Leckie No. 2 (mine samples)	do.....	S. B.	76907-09.....	3	2,760	4.60	.80
Do.....	do.....	Leckie No. 2 (run-of-mine, 6 cars)	do.....	S. B.	77595.....	1	2,570	7.15	.92
Do.....	do.....	Lillybrook No. 2 (mine samples)	do.....	S. B.	76484-88.....	3	2,720	4.11	.91
Do.....	do.....	Lillybrook No. 2 (run-of-mine, 6 cars)	do.....	S. B.	77722.....	1	2,610	5.67	1.09
Do.....	Hotcoal.....	Gulf (Hotcoal) (mine samples)	Beckley.....	S. B.	76924-27, 68.....	5	+2,810	4.05	.72
Do.....	do.....	Gulf (Hotcoal) (run-of-mine, 10 cars)	do.....	S. B.	78568.....	1	2,960	6.50	.62
Do.....	Lego.....	Laurel Smokeless (mine samples)	Pocahontas No. 3.....	S. B.	76542-43.....	2	2,780	4.49	.82
Do.....	do.....	Laurel Smokeless (run-of-mine, 2 cars)	do.....	S. B.	78653.....	1	2,820	8.94	.74
Do.....	Lester.....	Neal (mine samples)	Sewell.....	S. B.	76951-52.....	2	2,570	4.88	1.00
Do.....	do.....	Neal (run-of-mine, 2 cars)	do.....	S. B.	76501.....	1	2,510	12.43	1.37
Do.....	Lillybrook.....	Lillybrook No. 1 (mine samples)	Fire Creek.....	S. B.	76398-401.....	4	2,660	4.79	.97
Do.....	do.....	Lillybrook No. 1 (run-of-mine, 84 cars)	do.....	S. B.	76241.....	1	2,770	6.22	.88

TABLE II.—Comparison of softening temperatures of coal ash from mine and car samples—Continued.

State.	County.	Town.	Mine.	Coal bed.	Type of coal.	Laboratory No.	Number of samples.	Average softening temperature, °F.	Average analysis of dry coal, percentage of—	
									Ash.	Sulphur.
1	2	3	4	5	6	7	8	9	10	11
West Virginia...	Raleigh...	Lillybrook...	Lilly and Hornbrook No. 3 (mine samples).	Pocahontas No. 6.	S. B.	76551-52.	2	2,740	5.13	0.83
Do.	do.	do.	Lilly and Hornbrook No. 3 (run-of-mine, 2 cars).	do.	S. B.	76183.	1	2,670	9.95	.90
Do.	do.	McAlpin.	McAlpin (mine samples).	Beckley.	S. B.	68259-60.	2	+2,870	2.85	.65
Do.	do.	do.	McAlpin (run-of-mine, 21 cars).	do.	S. B.	77720.	1	2,790	7.02	.64
Do.	do.	Pemberton.	Pemberton (mine samples).	do.	S. B.	76892-94.	3	+2,920	5.43	.67
Do.	do.	do.	Pemberton, (run-of-mine, 4½ cars).	do.	S. B.	78587.	1	2,820	7.34	.75
Do.	do.	do.	Ragland (mine samples).	do.	S. B.	77223-25.	3	+2,930	6.20	.59
Do.	do.	do.	Ragland (run-of-mine, 5 cars).	do.	S. B.	77531.	1	2,900	7.46	.68
Do.	do.	do.	Raleigh No. 3 (mine samples).	do.	S. B.	10624-27.	2	2,670	3.67	.75
Do.	do.	Raleigh.	Raleigh No. 3 (run-of-mine, 8 cars).	do.	S. B.	77593.	1	2,720	4.32	.71
Do.	do.	do.	Cranberry No. 2 (mine samples).	Sewell.	S. B.	76672-75.	4	2,660	2.99	.73
Do.	do.	Stelton.	Cranberry No. 2 (run-of-mine, 9 cars).	do.	S. B.	78874.	1	2,740	5.48	.81
Do.	do.	do.	Slab Fork No. 1 (mine samples).	Beckley.	S. B.	14337.	1	2,590	2.87	.61
Do.	do.	Slab Fork.	Slab Fork No. 1 (run-of-mine, 16 cars).	do.	S. B.	77328.	1	2,800	5.53	.71
Do.	do.	do.	Slab Fork No. 2 (mine samples).	do.	S. B.	14325-26, 28-30, 68154, 56, 61.	8	+2,740	3.69	.50
Do.	do.	do.	Slab Fork No. 2 (run-of-mine, 3½ cars).	do.	S. B.	77329.	1	2,800	5.87	.69
Do.	do.	do.	Tamroy (mine samples).	Sewell.	S. B.	68166-68.	3	+2,850	1.97	.50
Do.	do.	Tamroy.	Tamroy (run-of-mine, 4 cars).	do.	S. B.	77132.	1	2,440	4.43	.85
Do.	do.	do.	Viacoira (mine samples).	do.	S. B.	77183-84.	2	2,910	12.95	.54
Do.	do.	Viacoira.	Viacoira (run-of-mine, 2 cars).	do.	S. B.	76380.	1	2,800	16.09	.63
Do.	do.	Winding Gulf.	Winding Gulf No. 1 (mine samples).	Beckley.	S. B.	14368-70, 76935-37.	6	+2,860	3.14	.54
Do.	do.	do.	Winding Gulf No. 1 (run-of-mine, 11 cars).	do.	S. B.	77637.	1	2,640	5.92	.50
Do.	Wyoming.	Bud.	Thermo Pocahontas (mine samples).	do.	S. B.	76090-92.	3	2,600	5.09	1.25
Do.	do.	do.	Thermo Pocahontas (run-of-mine, 8 cars).	do.	S. B.	75801.	1	2,440	8.23	1.57
Do.	do.	Caloric.	Smith Pocahontas (mine samples).	Pocahontas No. 3.	S. B.	75966-68.	3	2,800	7.06	.95

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